American Gas Association MONTHLY

Natural Gas in War Production

•

Saving Tin in Meter Soldering

•

War and Post-War Sales Survey

•

Conserving Oil in Gas-Making

•

Drying by Gas Infra-Red Method

October 1942

VOLUME XXIV NUMBER 9

A glass life raft?

...That's only one of the many new products in Ceramics...and GAS is helping in the swing!

Shortages in "priority" metals have given the ceramics field new opportunities to make needed civilian products out of clay and glass, in scores of new shapes and forms.

Not only are such things projected for war as glass life rafts, which will really float and which will resist destruction, but ceramics is playing a vital role in achieving victory through the making of many other war-essential products—instrument glass, glass noses for planes, insulators, spark plugs, optical glass.

Today the new trend to substitutions, replacing precious aluminum, alloy steels, plastics, copper, nickel and rubber, is giving ceramics a whole set of new problems. Some of them call for new heating applications with existing equipment.

Can we help you get better results with your present Gas-fired kilns or annealing lehrs? Or assist you in shifting to different products? Out of Gas engineering and research has emerged a great deal of new heating knowledge which is at your disposal. Call your Gas company for any help you need.

AMERICAN GAS ASSOCIATION
INDUSTRIAL AND COMMERCIAL GAS SECTION
420 LEXINGTON AVE., NEW YORK

THE TREND IS TO GAS
FOR ALL CERAMIC FIRING

This advertisement which appeared in the September issue of Ceramic Industry *is part of the Industrial and Commercial Gas National Campaign which is directed to large gas-using industries*

American Gas Association MONTHLY

CONTENTS FOR OCTOBER 1942

When sales managers of companies representing more than a quarter of the total meters in the gas industry sit down and answer a four-page questionnaire on sales, service, research and post-war planning, that's news! With the results all abstracted, digested and put into an article, it's a foregone conclusion that "something new has been added" to gas industry knowledge. We're referring, of course, to that article by E. J. Boyer which knocked many shorter articles by the wayside in this issue. Its fifteen pages (count 'em) should provide much to chew on at the Annual Meeting this month. . . . Perhaps the weakest link in the industry's thinking, judging by the survey, is the lack of attention to post-war factors. There's a big job for Mr. Beebee's new Post-War Planning Committee to do and we wish him all success in its accomplishment. . . . Messrs. Xenis and Kochendorfer present interesting results of tin soldering experiments which hold promising possibilities. . . . Also pertinent in this issue: facts on regrading gas mains, property records wrinkles, infra-red drying technique, and natural gas war production, not to mention that Beal medal winning paper on a new method of saving gas oil.

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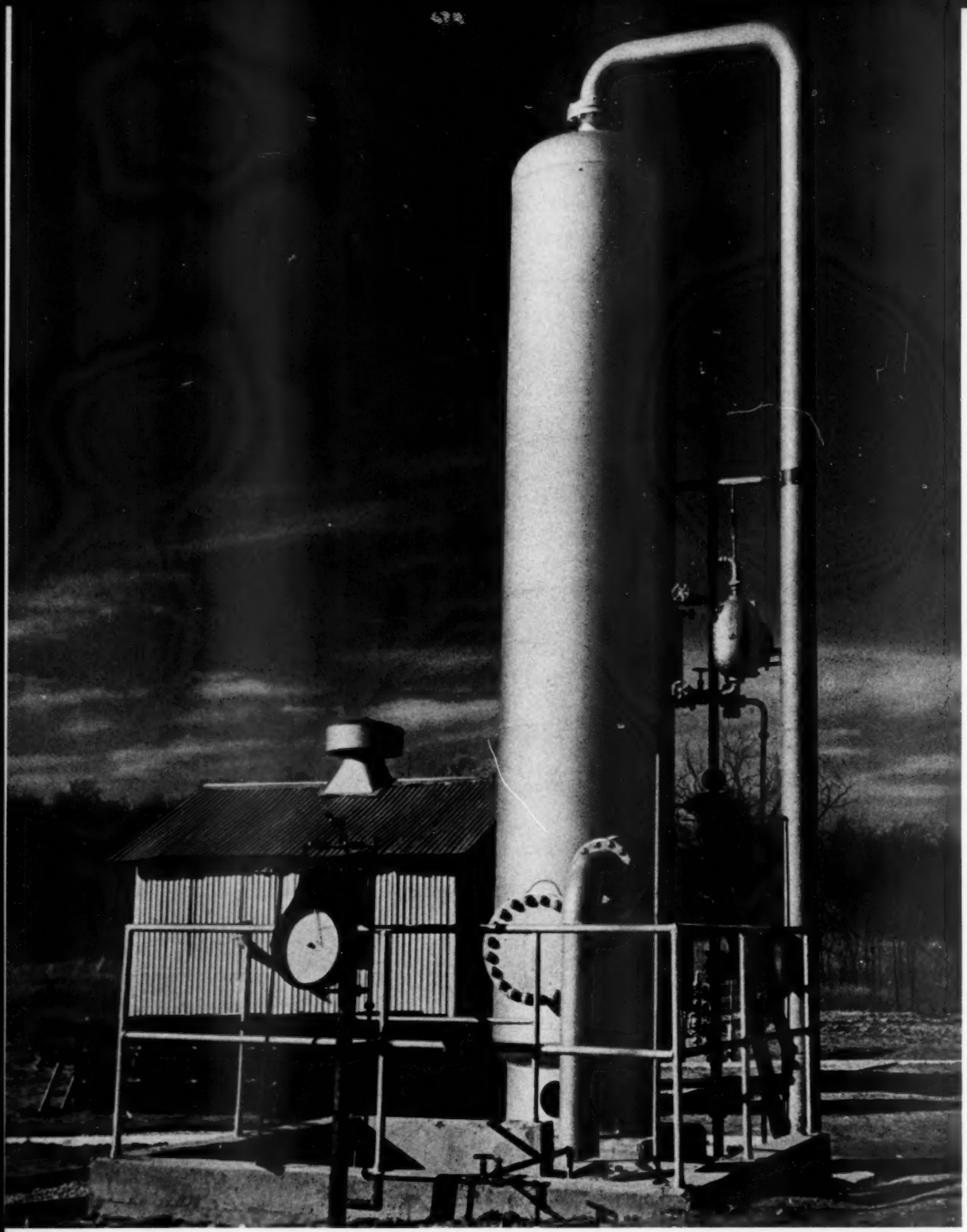
SUBSCRIPTION · $3.00 A YEAR

Published eleven times a year by the American Gas Association, Inc. Publication Office, American Building, Brattleboro, Vt. Publication is monthly except July and August which will be a bi-monthly issue. Editorial Offices, 420 Lexington Avenue, New York, N. Y. Address all communications to American Building, Brattleboro, Vermont, or to 420 Lexington Ave., New York, N. Y. All manuscript copy for publication should be sent to the editorial offices in New York. The Association does not hold itself responsible for statements and opinions contained in papers and discussions appearing herein. Entered as Second Class Matter at the Post Office at Brattleboro, Vermont, February 10th, 1922, under the Act of March 3, 1879.

Cable Addresses: American Gas Association
AMERIGAS, NEW YORK
American Gas Association Testing Laboratories
AMERGASLAB, CLEVELAND



Portion of a dehydration plant at Stroud, Oklahoma. This clear-cut picture is the second $5.00 prize winner submitted by Ruth Canaday of the Oklahoma Natural Gas Company, Tulsa, in the A. G. A. MONTHLY frontispiece contest.

American Gas Association MONTHLY

JAMES M. BEALL, *Editor*

WAR TOPICS
. . . To Dominate Gas Industry's Annual Meeting

IN line with Donald M. Nelson's admonition to the American people on Sept. 21 that there would be "no more gadgets, no more luxuries, no more comforts . . . . except what we simply must have to keep on fighting," the Annual Meeting of the American Gas Association at La-Salle Hotel in Chicago, Oct. 5 and 6, will be a brass tacks affair with no frills or furbelows. It will be concerned chiefly with putting the industry in fighting trim, eliminating every ounce of fat so that its sinews of war will be more effective.

The meeting will attempt to iron out all problems related to gas fuel which insure smoother operation of the complex war production machine. As explained by Mr. Nelson this machine does not always run evenly, "one part of it is forever getting ahead of another part, its unending drain on our supply of materials keeps showing itself in unexpected ways." The goal of the Annual Meeting is to marshall the gas industry's resources so that there will be no letup in its contribution to final victory.

•

Opening with Sectional meetings on Monday morning, the conference will continue throughout Tuesday with General Sessions devoted to the double-barreled theme of "The Gas Industry in the War and After the War." A feature speaker at the morning General Session will be J. A. Krug, deputy director general for Priorities Control, War Production Board, who will discuss "War Production Problems as They Affect the Gas Industry." Another highlight of this session will be the presentation of the gas industry's war record by Ernest R. Acker, chairman of the Committee on War Activities.

Other items on the morning session include the presidential address by George S. Hawley, president, The Bridgeport Gas Light Company, Bridgeport, Conn.; report of the treasurer by Mr. Acker; and election of officers.

At the General Luncheon following the first general session, awards for outstanding individual achievement will be presented. These include the Charles A. Munroe Award, Beal Medal, McCall Awards, and Million-Man Hour Awards.

The second General Session, Tuesday afternoon, will begin with an address on "The War Effort, Enforcement" by Mason Manghum, Compliance Division, War Production Board. The remainder of this session will be devoted to the theme "The Gas Industry After the War." The keynote speaker of this section will be A. M. Beebee of Rochester, newly appointed chairman of the Post-War Planning Committee.

"The Future of Natural Gas" will receive authoritative attention in an address by J. French Robinson, of Cleveland, chairman of the Natural Gas Section. War and post-war research problems will receive close attention from three angles: industrial and commercial gas research, John W. Batten, Detroit; Institute of Gas Technology program, Dr. F. W. Sullivan, Jr., Chicago; and domestic gas research, R. L. Fletcher, Providence, R. I. The final general session will conclude with a general discussion, including manufacturers, and a report of the Resolutions Committee.

•

Prior to the first General Session, the tenth annual Home Service Breakfast will take place. This program will be divided into two parts: (1) "Eat To Beat the Devil" with R. J. Canniff, Servel Inc., and Robert S. Goodhart, M.D., Nutrition in Industry Office of Defense Health and Welfare Service, Washington, D. C., as the principal speakers. (2) An illustrated digest of "War Service for Home Service" presented by Jeanette Campbell, Minneapolis. It is also expected to have short talks by industry officials.

Following are the highlights of the Sectional programs:

Natural Gas

On Monday morning following industry observations by President Hawley, President-Elect A. F. Bridge of Los Angeles, and Managing Director Forward, Chairman J. French Robinson will lead a symposium on "War Requirements in the Natural Gas Districts." The participants in this forum, including Mr. Robinson who is chairman of District 1, are the following chairmen of districts of the Office of Petroleum Coordinator; Burt R. Bay, Omaha (District 2); N. C. McGowen, Shreveport (District 3); R. W. Hendee, Colorado Springs (District 4); and William Moeller, Jr., Los Angeles (District 5). These men will present and discuss the vital war problems of the natural gas industry in their respective territories.

Two representatives of the government will then clarify WPB and OPC orders and their application to the natural gas industry. Martin T. Bennett, chief, Gas Supply Section, Power Branch, WPB, Washington, will discuss his department's directives and E. Holley Poe, director, Natural Gas and Natural Gasoline Division, OPC, Washington, and formerly secretary of the Association's Natural Gas Section, will speak on OPC rulings.

A brief business meeting, including the election of officers, will conclude the meeting.

Accounting

Three committees of the Accounting Section will hold sessions Monday morning but the regular annual meeting is scheduled to open with a luncheon session at noon. The latter will include the address of the chairman, L. L. Dyer, Dallas, election of officers, and a summary of "Developments in Depreciation Accounting" by H. C. Hasbrouck, New York, chairman of the Depreciation Accounting Committee.

A series of open meetings led by accounting committees will be held in the afternoon for discussion of problems arising from labor and material shortages, bi-monthly and quarterly meter reading and billing plans, priorities accounting, insurance depreciation, taxation accounting, and other war emergency procedures. The Customer Activities Group meeting under the direction of G. W. Fuchs, Philadelphia, will include committee presentations as follows: Customer Accounting, E. F. Embree, New Haven, chairman; Customer Collections, W. R. Seidel, Rochester, chairman; and Customer Relations, Ohmer Ullery, Columbus, chairman.

The General Accounting Activities Group led by Coordinator O. H. Ritenour, Washington, will be divided into Depreciation Accounting, H. C. Hasbrouck, New York, chairman; General Accounting, R. E. Hull, Shreveport, chairman; Materials and Supplies, Carl H. zur Nieden, Philadelphia, chairman; Property Records, E. F. Wressell, Hammond, chairman; and Taxation Accounting, R. M. Campbell, New York, chairman. There will also be an insurance meeting under the direction of Reginald Fleming, chairman, to discuss war damage, vandalism, policy conditions, insurance values, etc.

Industrial and Commercial Gas

A luncheon Monday under the auspices of the Industrial and Commercial Gas Section and the Mid-West Gas Sales Council will open this phase of the program. The afternoon meeting, with George F. B. Owens, chairman of the Section, presiding, will be devoted to problems which have arisen in connection with the use of gas and other activities directly related to the war effort. Topics which have been suggested by members of the Managing Committee will be discussed and opportunity will be provided for all in attendance to ask questions on specific subjects.

Residential Gas

Under the chairmanship of E. J. Boyer of Minneapolis, the Residential Section will hold a round table forum devoted to discussion of four vital topics, namely: Maintaining Customer Contacts During the War, Domestic Gas Research, Industrial Nutrition Program, and Planning for Post-War Sales. New officers will be elected at this meeting and the chairman will review the year's residential sales activities.

Technical

Outstanding technical projects closely allied with the country's war effort will be discussed at the Technical Section's annual meeting. Following the address of the chairman, Harold L. Gaidry, New Orleans, and the election of officers, the Section's place in the war program will be encompassed by Ernest R. Acker, of Poughkeepsie, chairman of the A. G. A. Committee on War Activities. D. P. Hartson, chairman of the Technical Section's Committee on War Activities will report on the Section's accomplishments.

Vital war topics included on this program include: "Conservation of Gas Oil," J. H. Wolfe, Baltimore; "Tin Content in Solder," C. S. Gold-

(Continued on page 375)

George S. Hawley, President

Arthur F. Bridge, Vice-President

Ernest R. Acker, Treasurer

A. M. Beebee, Chairman, Post-War Planning Committee

J. French Robinson, Chairman, Natural Gas Section

John W. Batten, Chairman, Industrial Gas Research

Radio Interview . . . *Tells Story of Natural Gas in War Production Area*

Edward M. Borger

A radio interview with Edward M. Borger, President, The Peoples Natural Gas Co., representing the natural gas companies serving the greater Pittsburgh area given Tuesday night, September 8, at 11:15 o'clock over WJAS on Pittsburgh Chamber of Commerce program *"Pittsburgh Prepares."*

Announcer: The Greater Pittsburgh Committee is on the air once again with its weekly broadcast. Since the entry of the United States into the War, the title of this weekly program has been "Pittsburgh Prepares." Our purpose is to tell what Pittsburgh is doing to aid America's advance to victory.

Tonight we present Mr. Edward M. Borger, president of The Peoples Natural Gas Company. Mr. Borger is here as a representative of the Natural Gas industry in Pittsburgh, which includes, in addition to his own company, the Equitable Gas Company and the Manufacturers Light and Heat Company. He will be interviewed by Mr. James Thompson, whose voice you will now hear.

Mr. Thompson: Mr. Borger, I've heard a lot lately about Natural Gas and how important it is to war production in this district. I suppose most of us who are not familiar with the natural gas business are inclined to think of gas only in terms of cooking, water heating, refrigeration and house heating—without realizing that gas is also widely used in industry and particularly in industrial plants which today are engaged in producing war materials.

Will you tell us just what part gas plays in our war program in the Pittsburgh area, Mr. Borger?

Mr. Borger: Many of our listeners will probably be interested to know that in the year 1941 in the Pittsburgh area, more natural gas was used by industry than by domestic consumers. The combined figures for the three companies here show that nearly 60 per cent of total gas sales were to industrial customers.

Mr. Thompson: How does that percentage compare with pre-war years, Mr. Borger?

Mr. Borger: Well, as far as our own company is concerned—and I am sure the figures would be about the same for the other two companies—our own figures show that our industrial customers are using almost twice as much natural gas as in 1940—and most of it is being used in the manufacture of ships, guns, shells, bombs, and a lot of other vital war material.

Mr. Thompson: What are some of these other war materials?

Mr. Borger: Gun mounts; rolled armorplate for ships; forgings for tanks and armored cars; gas masks; optical lenses for range finders, binoculars, etc.; shell detonators; airplane propellers; timing devices for shells, torpedoes and bombs; and of course a wide variety of motors, generators, turbines, etc.

Mr. Thompson: Tell me, Mr. Borger, why is it that Gas is so important in the manufacture of these war materials?

Mr. Borger: Well, the principal reason is that most war materials, particularly those made of metals, require heat-treating during some stage of their manufacture—and heat-treating is a process for which Gas is ideally suited. As everyone knows, this is a mechanized war, and equipment used in war must be made to extremely close tolerances. Gun barrels, for example, must not only be straight and true and machined accurately, but the metal itself must be properly heat-treated to give it the proper toughness, maximum resistance to fatigue, etc. Or take armor plate. Armor plate must withstand impact and must not shatter under gun fire. Its surface requires one kind of heat treatment, the rest of it another type, and so on.

Gas, because it can be accurately controlled, and because it is flexible, and quick heating, is peculiarly well suited to the type of precision manufacture required for *war* materials. Our industrial customers know that it is a high-speed precision fuel. That is basically why it is in such wide use in industry today.

Mr. Thompson: And I suppose that is also the reason why it is necessary to use Gas wisely—to conserve it wherever possible—and to avoid wasting it.

Mr. Borger: Exactly! The unusually heavy demand on the gas companies here for Gas for industrial purposes makes it important that every foot of natural gas be used efficiently—that waste be eliminated in so far as is possible. No one who is interested in winning the war—and that includes everybody I am sure who is

listening to this program—wants the war to last a single day longer than is necessary. No one wants a single industrial plant to have to close down for a single hour for lack of gas. That's why we are telling all of our customers that "Natural Gas is vital to war industries—use it wisely."

Mr. Thompson: What's the situation regarding gas heat for new homes and gas for new heating customers? Can you get it now?

Mr. Borger: No, you can't. Government order L-31 prohibits a gas company adding any new gas heating customers.

Mr. Thompson: That probably is disappointing news to a lot of people. But, getting back to the war effort, do the gas companies render any special service to industrial users in addition to supplying them with gas for their heating processes?

Mr. Borger: Yes, a very important service. All gas companies in the Pittsburgh district have Industrial Departments each with a staff of Gas Utilization Engineers—experienced men well trained in all those industrial processes requiring heat. These men are making valuable contributions to the War effort. They work closely with industrial customers on any problem involving the use of Gas—pointing out improvements that can be made in present equipment, suggesting additional equipment or new devices that may improve the quality of finished product and speed up the manufacturing process.

Mr. Thompson: In view of the tremendous increase in the use of Gas by industry in this district, how has it been possible for the gas companies to keep their domestic customers supplied with the Gas they need and have been in the habit of using for their homes? It would seem to me that that would be quite a problem.

Mr. Borger: Of course it is. But the gas companies here began several years ago to increase their supply of natural gas. Long before Pearl Harbor—in fact very early in World War II, when our defense program was just beginning—we were well aware of the fact that as America got more and more into defense production, gas would be needed by industrial users in much greater quantities than before. We knew that Gas had the very qualities industry needed. Speed, because Gas is a quick-heating fuel. Precision, because Gas can be controiled with a high degree of accuracy. Flexibility, because in countless operation, big and little, Gas had already demonstrated its versatility and its adaptability to all sorts of heating and heat-treating applications.

Knowing these things about Gas—and knowing that the further our country got into defense and war production the more demand we would have for industrial gas—we long ago took steps to meet this situation.

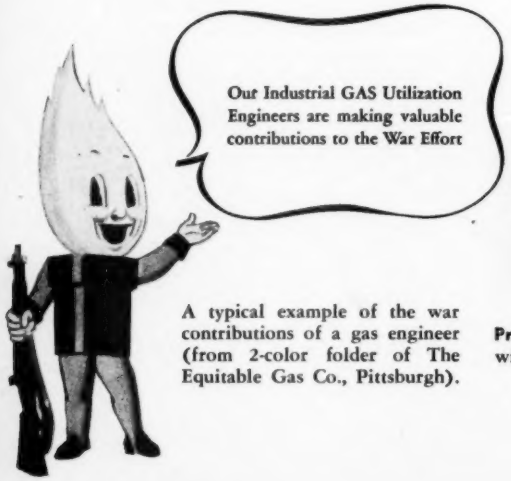
Mr. Thompson: Mr. Borger, would you care to tell us some of the things the gas companies have done to increase the supply of natural gas available to this area?

Mr. Borger: I'd be glad to, because it's a story we're all rather proud of. While all the Pittsburgh gas companies increase their facilities *each* year to take care of expanding demands—industrial, commercial and domestic—1941 saw a much larger than usual construction program. Hundreds of new wells were drilled in 1941—more than three times the average for the previous three years. And to handle the additional Gas, many miles of new transmission and pipe lines were added to our systems; additional compressor stations were built and others enlarged and improved. All of this has been approved by the War Production Board.

Mr. Thompson: Can you tell us, Mr. Borger, in actual figures, what these increased facilities amounted to, and how they affected the supply of Gas?

Mr. Borger: Well, for all three companies the figures are about as follows: In 1941, 292 new gas wells were drilled in gas producing properties in Pennsylvania, Kentucky and West Virginia. Three hundred and twenty-nine miles of new pipe line were completed. And at 14 locations on their transmission systems, compressing stations were built or enlarged. This 1941 construction program increased their capacity substantially. This year—1942—their capacity is being still further expanded, at a cost of over $8,000,000. Four hundred and thirteen new wells are included in this 1942 program—223 miles of new pipe lines are being installed, 4 compressor stations are being built or enlarged.

Mr. Thompson: Are the figures you



A typical example of the war contributions of a gas engineer (from 2-color folder of The Equitable Gas Co., Pittsburgh).

Problem—Industrial gas engineer discusses with the customer a heating application.

Design—The engineer supervises the development of gas applications to do the job.

have quoted for all three gas companies?

Mr. Borger: Yes, they are. I think it is a fair statement of the case to say that all of the gas companies serving the Pittsburgh district have done everything in their power to augment the gas supply and meet the increased demands of industrial, commercial and domestic customers.

By the way, Mr. Thompson, there is another angle to this gas supply question that I haven't discussed as yet. That's the underground storage of Gas.

Mr. Thompson: I'm afraid I don't quite follow you, Mr. Borger. Isn't all natural gas stored underground? I mean, since we get natural gas from wells, and since it is taken out as needed, it seems to me that just leaving the gas in the wells would give you all the reserve supply you needed.

Mr. Borger: But when we need extra supply of gas in Pittsburgh due to severely cold weather, we want a reserve supply of gas *right near here,* where we can get it to our customers without delay. That's why we have developed underground storage of natural gas for peak day demands.

Mr. Thompson: Do you mean that you actually reverse the usual process, and put Gas back *into* the ground?

Mr. Borger: Yes, we do. During the summer months, when the demand for gas is at its lowest ebb, huge volumes of natural gas are stored underground at locations convenient to the Pittsburgh district. You see, the problem is primarily one of transportation of gas over long distances. These underground storage pools, as they are called, are really gas warehouses from which gas can be released as needed. This underground storage is a new operating technique, developed in recent years, and it has given us a means of augmenting our supply of gas to take care of normal winter needs without endangering the supply of gas to our war plants.

Mr. Thompson: Do I understand that old exhausted gas wells are used for this underground storage?

Mr. Borger: Yes. But that doesn't mean that *any* exhausted well can be used for this purpose. The locations must be very carefully selected. Obviously it is necessary to find a well, or a group of wells, so located that once the gas is pumped back *into* them, it will stay there and not be lost or diffused so widely that it can't be drawn out again. The selection of storage pool locations is a nice problem in geology.

Mr. Thompson: Mr. Borger, you have mentioned "peak days" a number of times. Just what do you mean by peak days—and when do they come?

Mr. Borger: A *peak* day is one on which the demand for gas reaches an abnormally high level, due to extremely low temperature. On an extremely cold day, such as we had on last January 8, for example, when the temperature went to *nine below zero,* the demand for gas will be double the average daily demand. You can readily see what a strain this puts on our delivery system.

Mr. Thompson: But all businesses have peak days, haven't they?

Mr. Borger: Certainly, but in most businesses it is possible to know in advance when these peak days will occur. Florists, for example, know that their peaks will be Easter, Mother's Day, etc. Department stores know that their peaks will be Christmas time. And *knowing when* these peaks will come makes it comparatively easy to prepare for them.

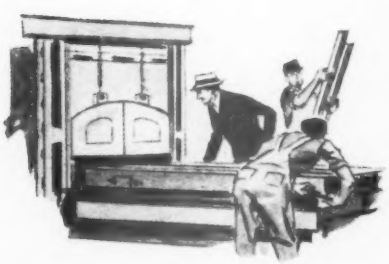
But in the gas business, the peak day is something *else* again. We never know in advance when we shall have a peak day—because we never know exactly when we are going to have a cold wave. Nor do we know how long that cold spell is going to last. And yet we have to be ready for it—and whatever the peak demand, it must be met—not at some time in the future, but right then.

You see, we in the gas industry feel that today we have a double responsibility. To provide gas for the *war production* front—for industry, as well as for the *home* front—for cooking, water heating, refrigeration, and house heating.

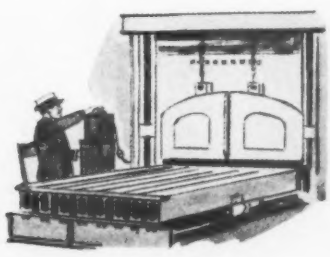
Mr. Thompson: In connection with the conservation of gas, to make sure that industry gets all it needs to continue producing vital war materials, I have been noticing recently some advertisements signed by the Natural Gas Companies here, selling the idea of insulation, storm-sash and doors and weather-stripping as a means of reducing heating costs. Do the gas companies themselves sell these materials?

Mr. Borger: No, we do not. We are sponsoring this series of advertisements for only one purpose. To help conserve supplies of fuel used for househeating purposes—not only gas, but other fuels, too—fuels

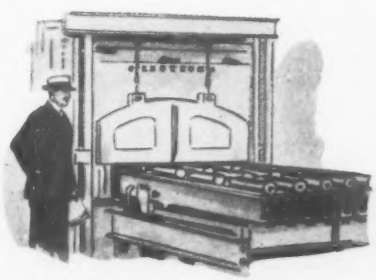
(Continued on page 376)



Erection—He offers technical assistance while equipment is being erected.



Testing—He inspects and thoroughly tests equipment after erection.



Production Plus—Tons of war equipment rolling off the line ahead of schedule.

Tin Conservation . . . *in Reassembling Gas Meters with Low Content Solders*

By C. P. XENIS and
A. F. KOCHENDORFER

Consolidated Edison Company of New York, Inc.

THE tin conservation orders of the War Production Board specify substantial reductions in the tin content of solders used in repairing and reassembling gas meters as well as other soldering applications. The Consolidated Edison Company of New York, Inc., has carried out a development and test program to find a low tin content solder formula for gas meters, which will

a) meet the requirements of the War Production Board as to tin content,
b) permit the reassembly of meters without undue mechanical difficulties,
c) result in the net saving of tin per meter reassembled,
d) result in a meter assembly capable of giving safe field operation.

Experience with two solder formulae (a) 30% tin, 68.1% lead, 1.8% antimony, .1% arsenic and (b) 30% tin, 2% antimony, 68% lead, leads us to believe that these requirements have been met reasonably well. It is of course impossible to predict accurately its long range performance in the field, nor can we await the results of extensive field operation before we start conserving tin. Accelerated life tests under vibration, heating and cooling cycles above normal pressures, etc., were applied on meters assembled with these proposed low tin content solders as well as the conventional 50% tin-50% lead solder, to provide a comparison with a known standard. Such detailed comparisons as outlined below were the basis for predicting the probable long range adequacy of the proposed formula.

The solder recommended (30% tin, 2% antimony, 68% lead) is the best we have found to date. It is hoped that other investigators of the problem will check our findings as well as try other formulae. It should be remembered, however, that when a new solder is issued to the meter shop, the results at first will be disappointing until the long established practices adapted to the use of the 50% tin-50% lead solder are adjusted to yield the optimum results with the specific formula being adopted.

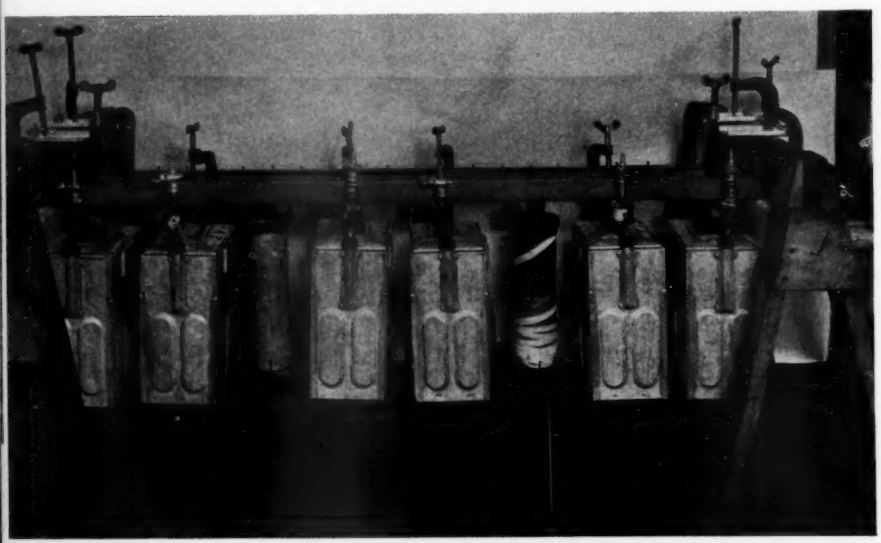


Figure 1. Vibration test arrangement

Various Solder Formulae Tested

A large number of solder formulae were investigated in order to select the most satisfactory one. This work consisted of assembling meters, using the various formulae and observing the results obtained. The various solder formulae were submitted by manufacturers as being worth investigating and when any one formula appeared at all promising the manufacturers were asked to submit additional samples slightly varying some of the critical elements in order to obtain more satisfactory results. Table No. 1 lists 26 solders thus investigated and the results obtained. It should be realized that these investigations were limited to small samples and while they enabled us to select the low tin content formulae items 17 and 18 which ultimately proved the most satisfactory with normal meter shop tools, we are not prepared to say that some of the other formulae if further explored might not yield satisfactory results.

Table No. II gives the results of bond strength tests on various solder formulae used with different fluxes. It reveals that the grease flux now in use gave as favorable results with the 30% tin, 2% antimony, 68% lead solder as any of the other fluxes under test.

Vibration Tests

The set-up illustrated in Fig. 1 shows the assembly of equipment used to determine the effect of vibration on meters assembled with solders of the following compositions:

Figure 2. Refrigerator used for cooling test

	No. of Meters	*No. of Hours on Test*	*No. of Leaks*
50% Tin 50% Lead	2	1900	None
30% Tin 68.1% Lead 1.8% Antimony 0.1% Arsenic	2	1900	None
30% Tin 68% Lead 2% Antimony	(2 (6	1700 1450	None None

The beam on which the meters are mounted is vibrated by means of two solenoids at a frequency of 50 cycles per second with an amplitude of 0.005 of an inch. The meters are tested under pressure daily to locate leaks and while this test has not revealed any leaks to date, the two meters assembled with 50% tin and 50% lead solder, and one meter assembled with 30% tin, 1.8% antimony, 68.1% lead, 0.1% arsenic solder show signs of cracking. The water entering these slight cracks during the daily water immersion test under pressure to locate leaks has started a small amount of corrosion at these cracks. The results obtained on this as well as other tests on the two formulae of solder namely, (a) 30% tin, 1.8% antimony, 68.1% lead, .1% arsenic, and (b) 30% tin, 68% lead, 2% antimony are so similar that as far as we can tell the two formulae should give about the same long range performance.

Heating and Cooling Tests

The results of the heating and cooling tests are given in Table III and the equipment used for this test is shown in Figs. II and III. The test consisted of setting the pressure at 0.4 pounds per square inch at room temperature and heating the meters to 80 degrees Centigrade for approximately one hour with a resulting increase in pressure. The meters were then tested for leaks by immersion in water with the meter pressure set at 0.9 pounds per square inch. The pressure was then increased to 2.3 pounds per square inch and the meters placed in the refrigerator at minus 5 to minus 10 degrees Centigrade for approximately 1½ hours. When the meters attained this temperature, they were retested at 0.9 pounds per square inch for leaks and then prepared for another heating cycle. The meters were subjected to these heating and cooling cycles until a leak developed. The recommended formulae of low tin content solders, namely 30% tin, 68.1% lead, 1.8% antimony, 0.1% arsenic, and 30% tin, 2% antimony, 68% lead give better results on this test than those obtained with the conventional 50% tin-50% lead solders. These tests indicate that long range performance in the field will be satisfactory with these low tin content solders and may be better than obtained with the 50% tin-50% lead solders.

The 38% tin 62% lead solder is shown by this test to be somewhat inferior to the 50% tin-50% lead solder failing at an average of 37 cycles. It is felt that unless field experience can be found to prove the acceptability of this solder, its performance on this test might justifiably raise a question as to its long range performance in the field.

Shop Experience

Approximately 60,000 meters have been assembled using the two formulae (a) 30% tin, 68.1% lead, 1.8% antimony, 0.1% arsenic (b) 30% tin, 68% lead, 2% antimony. The test results on these solders are very similar and our choice in favor of the latter has been made on the basis that it is easier to mix and control locally when converting 50% tin-50% lead solder.

When the new formulae were at first used in the shop, production work dropped by about 25 percent, but as the men continued to use these solders

TABLE (I)

SUMMARY OF SOLDER FORMULAE INVESTIGATED

Solder Designation	*Solder Composition*						*Liquidus Temp.°F*	*Qualities by Inspection*	
	Tin	*Lead*	*Silver*	*Antimony*	*Bismuth*	*Arsenic*		*Tinning*	*Joint*
1 F1	30	66.75	1.25	2.0	...	...	480	Fair	Slightly White
2 F4	30	66.95	1.25	1.8	...	...	480	Fair	Slightly White
3 F3	30	66.75	1.25	1.0	...	...	480	Fair	Slightly White
4 F2	30	66.75	1.25	0.5	0.5	...	480	Fair	Cracks
5 B383	30	68.5	1.5	...	...	...	461	Poor	Cracks
6 500	30	65	1.5	0.5	3.0	...	...	Fair	Cracks
7 B378	27	71.5	1.5	...	...	...	475	Poor	Cracks
8 468	20	75	1.5	0.5	3.0	...	...	Fair	White
9 585	5	93.5	1.5	...	...	...	585	Poor	Dull & Rough
10 I	25	72.7	...	2.3	...	...	...	Fair	Cracks
11 II	25	73	...	2.0	...	...	...	Fair	Cracks
12 III	27	70.7	...	2.3	...	...	...	Fair	Slightly White
13 IV	27	71	...	2.0	...	...	...	Fair	Cracks
14 B385	30	68.5	...	1.5	...	...	477	Fair	Clean
15 B385 AR	30	68.4	...	1.5	...	0.1	480	Fair	Cracks
16 B384	30	68.2	...	1.8	...	...	473	Fair	Slightly White
17 B372	30	68.1	...	1.8	...	0.1	484	Good	Slightly White
18 B386	30	68	...	2.0	...	...	469	Good	Clean
19 MB 2.1	30	67.9	...	2.1	...	...	...	Good	Slightly White
20 MB 2.2	30	67.8	...	2.2	...	...	...	Good	Slightly White
21 B395	30	67.7	...	2.3	...	...	467	Good	Slightly White
22 B396	30	67.4	...	2.6	...	...	464	Good	Cracks
23 5	..	97.5	2.5	...	...	...	...	Poor	Rough
24 50/50	50	50	...	...	...	...	412	Very Good	Clean
25 38/62	38	62	...	...	...	...	462	Very Good	Clean
26 30/70	30	70	...	...	...	...	500	Poor	Cracks

Figure 3. Oven used for heating test

TABLE (II)

RESULTS OF BOND STRENGTH TESTS ON VARIOUS SOLDERS

Solder Mix Designation	Composition of the Various Solders Used During Tests—Per Cent						Bond Strength Tests—Pounds Per Square Inch of Lapped Area								
							Grease Flux 4 Tests			Acid Flux 2 Tests		Sterine Flux 2 Tests		G. E. Stick Flux 2 Tests	
	Tin	Lead	Silver	Antimony	Bismuth	Arsenic	Min.	Max.	Avg.	A	B	A	B	A	B
F1	30	66.75	1.25	2.0	...	...	2610	3250	2880	2650	2770	3250	..	3420	..
F4	30	66.95	1.25	1.8	...	...	3210	3640	3350	3090	3140	3050	..	...	..
F3	30	67.75	1.25	1.0	...	...	2860	3520	3250*	2130	..	3640	..	2980	..
F2	30	67.75	1.25	0.5	0.5	...	3170	3510	3270	3170	3260	3010	..	3480	..
B-383	30	68.5	1.5	...	...	...	2860	3300	3040	3220	..	2740	..	2820	..
500	30	65.0	1.5	0.5	3.0	...	1030	3090	2345	2840	2950	2900	..	2610	..
B-378	27	71.5	1.5	...	...	...	2610	3040	2780	2770	2940	2730	3120	2870	2900
468	20	75.0	1.5	0.5	3.0	...	2250	2780	2480	2800	..	2560	2610	2590	..
585	5	93.5	1.5	...	...	...	2510	3160	2730	2920	..	2430	2890	1400	..
I	25	72.7	...	2.3	...	...	3320	3360	3340†	3350	3460	3390	..	...	..
II	25	73.0	...	2.0	...	...	3080	3330	3210*	3540	..	3310	..	3580	3590
III	27	70.7	...	2.3	...	...	3260	3480	3370†	3220	..	3330	..	...	..
IV	27	71.0	...	2.0	...	...	3180	3330	3270*	3350	3360	3210	3300	3410	..
B-385	30	68.5	...	1.5	...	...	3070	3290	3200	2970	3210	2870	2990	3090	..
B-385 AR	30	68.4	...	1.5	...	0.1	3010	3260	3130	3240	..	2850	3230	2610	..
B-384	30	68.2	...	1.8	...	...	3110	3280	3170	3290	3360	3110	..	2960	..
B-372	30	68.1	...	1.8	...	0.1	2790	3320	3010	3540	3630	3210	3440	1150	3060
B-386	30	68.0	...	2.0	...	...	3210	3360	3290	2920	3000	2820	2850	2880	..
B-395	30	67.7	...	2.3	...	...	2530	3330	2950*	2510	2610	2580	3200	2670	3550
B-396	30	67.4	...	2.6	...	...	2640	3280	3020*	2730	..	2870	..	2780	..
50-50	50	50.0	...	...	...	...	2970	3630	3220*	3010	..	...	..	2440	..
38-62	38	62.0	...	...	...	...	3060	3150	3100†	2770	3030	3170	3310	3410	..
30-70	30	70.0	...	...	...	...	2850	3550	3200*	2720	3240	2730	2900	..	..

* Three Tests.
† Two Tests.

they improved their production so that now it is less than 5 percent lower than their former production with 50% tin-50% lead solder.

The poundage of solder now used is approximately 8 percent higher than that used with the 50% tin-50% lead formula. Therefore, the net saving in tin per meter reassembled is 35 percent. In the case of the Consolidated Edison Company meter shops the saving in tin will amount to approximately 20,000 pounds per year.

A question pertinent to the use of the proposed low tin formulae is the conversion of 50% tin-50% lead solder from stock or salvaged from meters. Formula (b) 30% tin, 68% lead, 2% antimony can readily be mixed by purchasing a toner metal containing 5% antimony and 95% lead. The composition of the toner metal can be varied to fit the percentage of lead and tin in the solder to be toned. The toning operation requires a melting pot in which temperatures can be reasonably well controlled and the mixer readily agitated. The toner metal and solder to be mixed must be weighed accurately. Unless these facilities are available it is recommended that the toning be done by solder manufacturers who have the personnel and equipment to give good results. No important difference has been found between the use of cast or extruded bars.

(Continued on page 375)

TABLE (III)

RESULTS OF HEATING AND COOLING TESTS ON GAS METERS HAVING SEAMS SOLDERED WITH VARIOUS SOLDERS

Solder Mix Designation and Composition in Per Cent	Company No. on Meter	Cycle No. During Which Failure Occurred	No. of Cycles on Test	Location of Failure
			(No Failure)	
F-1	586–909		94	.....
Tin 30	586–914	20	..	Top seam—corner inlet and front
Lead 66.75	586–916	48	..	Horizontal seam—back
Silver 1.25				
Antimony 2.0		34 Avg.		
B-395	588–902	..	48	.....
Tin 30	588–831	..	45	.....
Lead 67.7	588–894	..	37	.....
Antimony 2.3				
B-396	590–346	11	..	Top seam—back
Tin 30	588–828	..	30	.....
Lead 67.4	588–794	..	15	
Antimony 2.6				
50-50	C878–187	34	..	Horizontal seam—back
Tin 50	D105–298	94	..	Top seam—inlet
Lead 50	C849–942	21	..	Horizontal seam—back
	W.L.C.	9	..	Top seam—corner, back and inlet
		40 Avg.		
B-372	574–296	220	..	Top seam—front
Tin 30	574–281	39	..	Vertical seam—inlet front
Lead 68.1	574–278	15	..	Horizontal seam—back
Antimony 1.8	574–293	194	..	Horizontal seam—back
Arsenic 0.1	597–731	..	49	.....
	597–712	..	49	.....
	597–307	..	48	.....
		117 Avg.		
B-386	586–727	141	..	Horizontal seam—front
Tin 30	586–731	157	..	Top seam—back
Lead 68.0	586–730	46	..	Top seam—outlet
Antimony 2.0	591–074	95	..	Top seam—back
	591–068	..	168	
	591–071	131	..	Horizontal seam—front
	593–718	18	..	Horizontal seam—back
	591–055	..	166	.....
	591–072	150	..	Horizontal seam—back
	591–048	115	..	Top seam—back
		107Avg.		
B-385	586–732	88	..	Top seam—inlet
Tin 30	586–963	13	..	Top seam—corner inlet and front
Lead 68.5	586–922	110	..	Horizontal seam—back
Antimony 1.5				
		70 Avg.		
38–62	871–827	20	..	Top seam—corner inlet and front
Tin 38	571–433	47	..	Top seam—outlet
Lead 62	570–698	47	..	Top seam—back
	572–101	34	..	Vertical seam—outlet back
		37 Avg.		

WAR AND POST-WAR GAS SALES, SERVICE AND RESEARCH SURVEY

By E. J. BOYER

Chairman, Residential Section, American Gas Association

- **This article includes material received from 32 manufactured, natural and mixed gas companies representing 4,934,596 meters which is 27.4% of the total meters in the gas industry.**
- **The sales plans, ideas and opinions summarized herein were received from one or more of these gas companies and do not necessarily represent the views of the Residential Section.**
- **This material has been compiled and published in the hope that it will be of assistance in facilitating the solution of the many problems relating to gas sales and service which have arisen as a result of the War.**
- **Many of these questions will be discussed at the Association's Annual Meeting in Chicago this month.**

ADVERTISING

THAT the war has had profound and far-reaching effect on gas advertising, as well as all other advertising, has been evident even to the casual observer for some months. What he did not know and what this national survey has undertaken to point out is how much advertising is being done, what new themes have been developed, and what steps have been taken to meet the drastically altered situation induced by the war. In other words, what was the national trend, if any?

Entry of the United States into the war brought about a thorough re-examination of advertising budgets and campaigns. Many companies have decided to maintain the momentum established in peacetime and are carrying on with normal appropriations. On the other hand, a substantial number of companies has made considerable reductions in their advertising expenditures.

A marked change in copy has characterized all current advertising. With few exceptions (where merchandise is available), the majority have discontinued merchandise advertising and are featuring institutional, educational, conservation, nutrition, and War Bond copy. Many companies are following the lead of the National Advertising Program and preparing a series of advertisements on the gas industry's war effort.

Advertisements devoted to the interpretation of the various Government limitation orders affecting gas service and appliance sales have been successfully used. A midwest gas company whose recent advertisements were devoted to an explanation of the WPB limitation orders and also directed inquiries to the gas company instead of WPB, substantially reduced the number of inquiries received at the local WPB office. This campaign was very effective and won hearty acclaim from government officials.

Special advertisements devoted to the salvage program as a means of promoting the war effort and increasing good will have proved effective. One company has run a series tying in with various phases of the war program under such captions as: "Now Uncle Sam Needs the Fat of the Land," "Serving My Family Is One of My Wartime Jobs," and "They Have Given Up a Lot of Things, How About You?" The story of gas appliances and service was entirely subordinated in this series.

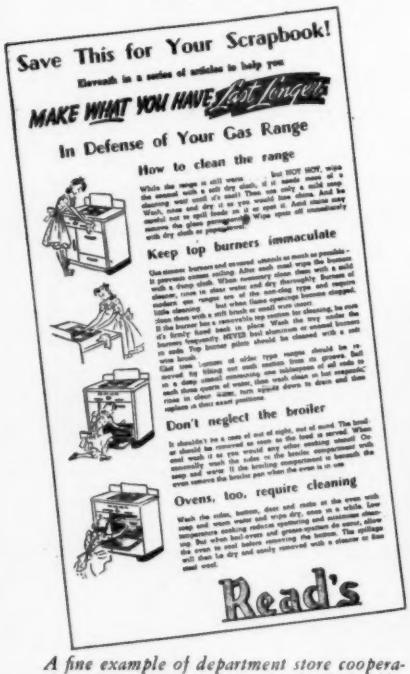
A fine case of cooperation on the part of local department stores was reported by a New England company. At the suggestion of the utility, these stores featured advertisements at their own expense devoted to the care of gas appliances. The copy was taken from the A. G. A. home service booklet, "Uncle Sam Wants It to Last."

A mass demonstration program for workers in war plants designed to promote better nutrition has been undertaken by one utility. This same company reports that, due to expanding war activities, approximately 500 new families per month are applying for gas service. These newly-arrived families are greeted with a letter of invitation and selected members are visited by residential gas representatives with a special welcome call.

Copy stressing the dependability of gas appliances, the simplicity of maintenance and repair, is being brought regularly to the attention of gas consumers in the belief that the public will continue to use the service after

the war which was found to be efficient, dependable, economical and adaptable to their war needs. It was one company's opinion that the identity of gas advertising should not be entirely subordinated to nutrition or other widely-adopted programs but should refer to the advantages of gas as a fuel if it is to have lasting effect.

Poster carrying theme of Nutrition in Industry campaign


Save This for Your Scrapbook!

Herewith is a series of articles to help you

MAKE WHAT YOU HAVE Last Longer

In Defense of Your Gas Range

How to clean the range

Keep top burners immaculate

Don't neglect the broiler

Ovens, too, require cleaning

Read's

A fine example of department store cooperation. Copy is taken from A. G. A. booklet "Uncle Sam Wants It To Last"

A widely-held view was: "We do not intend in any way to let our customers forget the value of modern gas equipment and its place in their homes."

Replying to specific questions regarding the media and type of local advertising favored, the majority indicated that newspaper copy was most effective but there was strong support for bill enclosures as a productive medium. A combination company is using bill enclosures to stress the necessity of curtailing consumer services, convey information on the nutrition program, the story of appliance conservation and the latest information on the blackout and dimout regulations for their electric customers. One company devotes 25% of its advertising budget to bill stuffers and reports most effective results. This same company devotes 70% of its budget to newspaper advertising featuring appliance conservation, nutrition, service and educational copy. The balance of the budget is used for display advertising.

All companies reporting the use of radio as a medium are continuing this advertising. These programs include daily spot announcements, some tied in with the regular radio programs devoted to home service, informing the customer of the limitations on the sale of gas and gas appliances, and other information, none of which has any sales promotional features.

In view of the transportation situation, the use of car cards was found to have increasing effectiveness. Window and store displays, direct mail, and billboard advertisements were recommended to round out the program.

As a wartime advertising credo for the gas industry the following was offered: "The utility company serving an entire community has an obligation to inform its customers of the changes brought about by war and how these changes affect their daily lives. The identity of the company *must* be preserved allying it with national and community activities. Without undue emphasis on the essentiality of its services, there is ample opportunity to keep before the public a recognition of the company's good citizenship and constant appreciation of the use and value of these conveniences which it makes possible."

Uncle Sam allows sale of Gas Ranges and Water Heaters
WPB Order L-79 Amended to Allow Installations Where Necessary
The Gas Company and Gas Appliance Dealers

This 24-sheet poster provides an effective tie-in with the first advertisement in the national magazine campaign

Fats are in the Fight, too
ATLANTA GAS LIGHT COMPANY
"SERVING
MY FAMILY IS ONE OF MY WARTIME JOBS"
MINNEAPOLIS GAS LIGHT CO.
BUSY HOME-MAKERS!
NUTRITIOUS WARTIME MEALS
GAS
Cut your Heating Costs 11% to 18%
with storm windows and doors...
Save further with insulation and weatherstripping
Natural Gas Companies

A variety of current gas advertisements, illustrating conservation, nutrition, and patriotic themes. This type of copy has been highly commended by government authorities

HOME SERVICE

THE range and scope of activities conducted by gas utility home service departments, as reported in this survey, are such as to demonstrate conclusively their outstanding contributions to the national welfare. Not only have these departments continued their peacetime activities unabated but almost without exception they have taken a leading role in community activities of Nutrition Committees, Red Cross, Civilian Defense and youth movements—all of vital importance to the war effort.

As a well-organized national group, with years of experience in aiding homemakers, home service departments were well equipped to translate the National Nutrition movement and other government-sponsored projects into effective local action. With the cessation of appliance promotion and the dwindling of the active selling contacts, the home service representatives have stepped in to maintain a community of interest between the gas company and a large portion of its customers. Their many activities have been reported in a series of articles in the A. G. A. MONTHLY (March, May, July-August and September) and in home service bulletins such as "Home Service Volunteers," and only the high spots and new developments will be mentioned briefly here.

The number of home service personnel is not large, ranging from one person in small companies to 33 in a large company, but they reach a large segment of the public. One company mentions the distribution of 125,000 recipes and the attendance of 3500 persons at home service lectures during the month of June alone. Some report their intention of enlarging their home service staffs as a means of retaining a large portion of their customer contacts. A few home service girls have joined the WAACS or the WAVES.

Home service classes for the study of nutrition, proper food preparation, selection and conservation, have been very effective in maintaining good customer relations and aiding the national better health campaign. An example of home service cooperation is the "Food for Fitness" nutrition course directed to war workers and their families. Composed of four lecture demonstrations, this course presents an around-the-clock discussion of food habits and nutrition information. A 16-page "Pack-A-Lunch-For-Victory" booklet is distributed by this company to all local war plants. In addition this utility's home service consultants conduct nutrition and canning courses for Red Cross, Civilian Defense, F.H.A. and similar agencies. Nutrition and conservation centers, staffed by home service girls, have been arranged by many companies. Servel's Home Volunteer program is widely used.

A series of nutrition charts has been compiled by one department based on Dr. Taylor's book "Food Value in Shares and Weights" which is used for class work and talks. Supervisors and group leaders have attended Farm Bureau Canning Classes in preparation for possible inquiries. Talks and skits on nutrition, planning school lunches, marketing, etc., have been given at Mothers' Clubs, P.T.A.

A wrinkle in home service showmanship. The mirror over the demonstration table gives the audience a close-up view

Left—A fine nutrition window display in San Antonio (foods are in natural color). Right—A home mechanics course being given in the Santa Barbara office of Southern Counties Gas Co. Mrs. Mildred Seaberg, home service director and instructor, is second from the left

Cover of a popular recipe booklet

and other groups, and home service has answered frequent requests for food information from advertising agencies and food editors. Radio and newspaper columns have been utilized to distribute nutrition information as well as material on the care and use of gas appliances.

A new trend was noted in the development of a "Home Mechanics Class" the object of which was to teach women to make minor adjustments on their gas equipment and how to relight pilots and equipment in order to avoid unnecessary service calls. The class was conducted by the home service director and the women were also informed of changes in service and collection policies as well as the company's preparation for wartime emergencies. Enrollment was limited to 20 so the women would have an opportunity to practice making adjustments, etc. The same class was given for the company's office employees.

The home service department of a southern company is using mass coverage to instruct customers in the care and use of equipment with individual calls in between group meetings. The company developed a repair card on which the names and kind of work that can be done by various repair dealers was shown. The home service advisors call attention to these repair cards at all group demonstrations and urge customers to have their equipment repaired and reconditioned before it is too late. The cards were delivered to all customers by company service delivery men, Boy Scouts and other groups.

While most companies stated that they are not using home service personnel to make door-to-door contacts, several indicate they are planning such a program. One company having 12,000 meters has prepared a complete set of survey forms listing every user and non-user in the city. It is hoped to reach every customer. In many cases, home service representatives contact customers upon request and automatically make follow-up calls after any new appliance has been installed.

Girl Scout class learning to make sandwiches for disaster relief. The Brooklyn Union Gas Company furnished the auditorium

The first Negro Red Cross Canteen Class to receive certificates in the Norfolk home service kitchen of Virginia Electric and Power Co.

THE rise in gas sales for industrial and commercial uses since the war began has been little short of phenomenal. When war came manufacturers of industrial gas equipment, who were already operating on a war footing, faced the task of still further increasing their output of furnces, ovens, burners, and all kinds of special gas-burning equipment needed by war factories in their efforts to increase production. Today, the gas industry is meeting the severe requirements of our all-out war machine in a most impressive way. In addition, it is supplying increasing quantities of gas to commercial concerns for baking, water heating, space heating, refrigeration, etc., and to army and navy training camps and other establishments.

Gas Sales Up 5% to 100%

The increase in use of gas for war industrial purposes in the companies surveyed ranged from 5 per cent to 100 per cent. Just where much of this gas is going was recently indicated by an industrial authority: "Process furnaces for carburizing, clean or bright hardening and convection heating are being applied to the manufacture of hundreds of thousands of jeeps, peeps, and mobile fortresses of all kinds; direct gas flame annealing of wire has made it possible to fly and fight with airplanes at 25,000 ft.; there are single gas furnaces turning out 82 miles of 50 caliber machine gun bullet clips a day, and so on, endlessly."

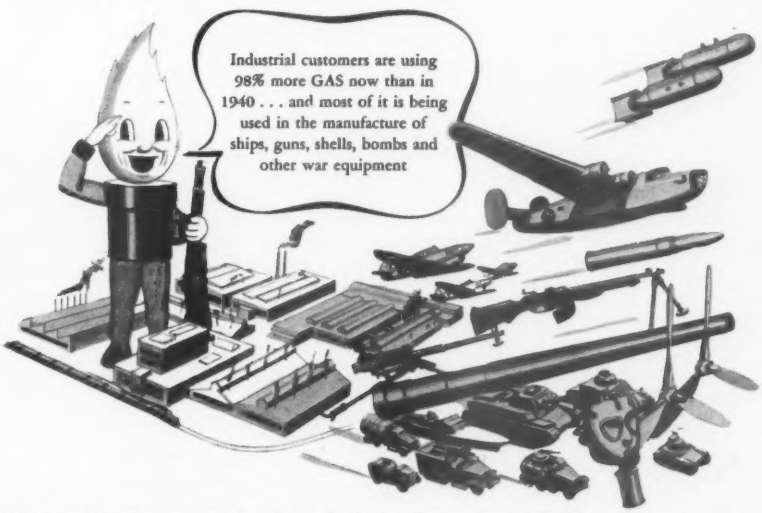
This tremendous war load has brought knotty problems of servicing and conditioning and created some apprehension regarding the post-war switch to peacetime production. However, it is the considered opinion of most companies, that gas has gained such prestige and is doing such an economical job that it will retain much of the post-war business. Plans being made to retain this load in the post-war period may be summarized as follows:

1. Inducing users to install only the best and most economical gas-designed equipment, so that overall operating costs will be low enough to make the substitution of other fuels unattractive.
2. Training all contact employees in order to keep public relations on the best possible basis.
3. Starting a commercial and industrial survey ahead of time so that gas load now being used for war purposes can be placed in more permanent channels as soon as possible.
4. An aggressive program of replacing antiquated equipment and frequent customer contacts.
5. Proper maintenance of customers' equipment as a means of assuring satisfactory operation and rendering best possible gas service.
6. Reminding the customer constantly of the advantages of gas fuel.

The following noteworthy program was submitted by one company:

1. As the retention of this business is largely dependent upon the continuity of industry, the gas business signed under present conditions is largely wrapped up in the problem of business mortality in the aftermath of the war. Obviously, the magnitude of mortality is difficult of determination at the present time as the conditions which will determine the extent of the loss are, themselves, difficult of evaluation. It is our intention to make a continuous study of this problem in the hope that some reasonable conclusions can be developed before the problem becomes acute.
2. The maintenance of friendly relations with all of these customers to build up their confidence in the company, their satisfaction with our service and our rates and practices is an important feature of our program which should aid in retaining the highest possible percentage of this business. We, therefore, feel that careful attention to adequate customer contact is particularly important during the war.
3. Better knowledge of the market and its needs, and close cooperation with the manufacturers of equipment is indicated in order to assure accurate solution of the customers' problems and the development of the proper methods to be used in attempting to hold business when the need arises.
4. The question as to the volume of business which can be held after the war in those plants which survive is definitely tied-in with the trend of conditions with respect to competitive fuels. Prices of equipment will be affected by the volume of second-hand equipment available and it is quite possible that those fuels which are subject to wide price fluctuations will be available in quantity at greatly reduced prices. A study of competitive trends is, therefore, highly important if we are to develop an intelligent approach to the retention of business when the war is over.

Urging war workers to eat nutritious foods is the purpose of the Nutrition in Industry campaign


Industrial customers are using 98% more GAS now than in 1940 . . . and most of it is being used in the manufacture of ships, guns, shells, bombs and other war equipment

The Equitable Gas Co., Pittsburgh, used this sketch in a recent pamphlet to show the numerous applications of gas in war production industries

THE impact of war caused high mortality among residential sales programs and froze many new business activities for the duration. However, most companies are carrying on such activities as are in line with current limitations on the sale of gas and gas appliances and are attempting to lay the groundwork for an aggressive post-war program.

One step looking to post-war activity is the accumulation of a record of all requests for various types of equipment which is currently frozen so that a live prospect list will be immediately at hand the minute the war is over. The Home Volunteer program has been widely adopted and is reported to be a large factor in laying the groundwork for future residential sales work. In general, sales plans are extremely flexible and will be adapted to prevailing conditions with an eye to the future. The effect on sales personnel has been far-reaching and it is felt that the following account of their activities fully reflects the change in current sales work:

Personnel

A general reduction in residential sales personnel is reported by the majority. In many cases salesmen have left to go into the armed forces or to take jobs in defense industries. The majority of companies, however, indicate that they have retained a nucleus of their residential sales personnel as the basis for rebuilding their sales departments when conditions return to normal. In addition to retaining this nucleus, a number of companies have transferred sales personnel to other departments where they will be readily available at the end of the war.

One company which has retained its residential sales supervisor personnel but has eliminated its territory salesmen entirely plans to keep in touch with the latter by means of a news letter advising them of company activities and news regarding the location and activities of former employees. This company feels that a large majority of these men are engaged in war work which will be finished at the end of the war and sees no reason why they will not return to the utility later. Another company is retaining street and floor sales personnel with 10 years or more of service.

A full force of dealer coordinators has been maintained by one utility to work with dealers during the emergency and to assist them in securing merchandise available and to formulate adequate repair departments. This company also plans an expansion of its home service department so that the market may be conditioned for the post-war period through group demonstrations.

Sales personnel are being used to survey all customers, sell appliances under government restrictions, effect minor repairs and servicing of gas appliances, contact architects, builders, banks and dealers, etc., and assist them in solving gas service problems. Some salesmen are required to turn in a brief written report of the problems encountered in order that the company may be kept informed of customer problems and reaction. One company is considering the use of its sales personnel to participate in industrial nutrition projects and is planning to train them on the basic principles of proper nutrition.

In one case a house-to-house canvass is made to obtain up-to-date information and the survey cards are posted on a visible card record in the sales department for use after the war emergency. Representatives answer by personal call all inquiries for merchandise and if they cannot sell, they instruct customers in the proper method of caring for present appliances.

One entire sales force is engaged in selling house insulation, storm windows and weather stripping. All sales are handled direct with the jobbers of these items who also pay all commissions. This program was launched on the patriotic "Conserve heating fuels this winter" theme and all house heating customers received a letter outlining at least ten ways in which heat conservation may be effected.

Another company's sales personnel, including residential, is now handling all industrial inquiries, request for replacement of old appliances and installation of new appliances, complaints on appliance operation as well as high bill complaints, etc. Salesmen are also being used to check unused meters, assist in house heating equipment inspection, and cooperate with the F.H.A. and all persons working on war housing. A floor and field help department to answer customers' questions is conducted in one city.

Compensation

Various methods of compensating sales personnel were reported, the most common of which is straight salary. Among the compensation plans are the following: straight salary; salary and commission; basic salary plus 5% bonus based on load building value of appliance sold; basic salary plus sliding scale commissions.

Market Surveys

As stated previously, sales representatives in some companies are being utilized to conduct market and appliance surveys but many are not now engaged in this activity. One company requires its residential salesmen to re-

As these advertisements indicate, the gas industry is doing its utmost to inform its customers of the need for conservation of food, fuel and equipment and is also taking an active part in community salvage and other programs to aid the war effort. Much of the copy refers customers to home service departments for further information

Vigilance in the kitchen—a new watchword for the American housewife is the keynote of the V-series shown here (right)

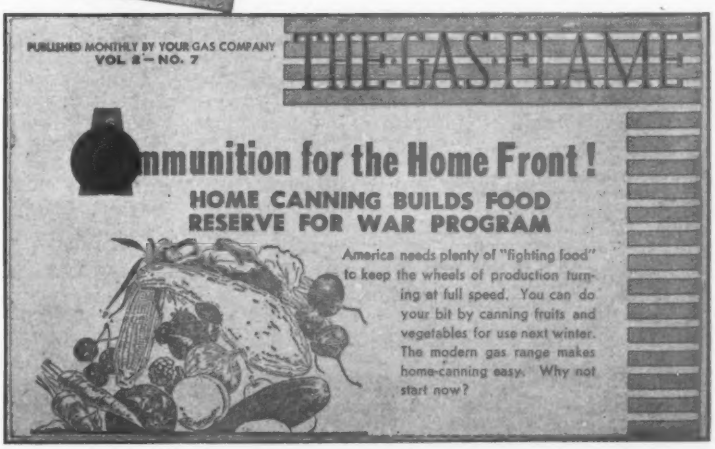
port on the nature and extent of gas equipment in at least ten customers' premises each day. This utility and others which are conducting surveys regularly feel that they are strengthening their post-war marketing position as well as insuring good customer relations for the duration.

Among the surveys being conducted are: appliance age and replacement, appliance service, ownership, anticipated revenue from new customers, load building value of new gas ranges, and average load added by gas refrigerators. In many towns, systematic customer contacts are being made by servicemen to inspect and adjust gas equipment. One company has a check on the back of each inspection order on which the servicemen check off the appliances and condition during each service call. This record is then analyzed when the service order returns to the office. Another company plans to make an analysis of the value of CP range sales and a spot check of appliances.

Dealer Cooperative Sales Plans

Among the variety of dealer cooperative plans now in effect are the following:

1. Company accepts leads from local plumber dealers and receives commission when sale is closed by company salesmen. Dealer receives larger commission when he closes sale and a further increase in commission when the sale is for cash and is not financed by the company. Appliances are sold to the dealer at discount and are also consigned to him for display. All deliveries are made by the gas company direct to the customer. Further assistance to the dealer is the furnishing of display material and literature, company advertising mentioning dealers, and of company salesmen in closing sales, and the turning over of all appliance connection work to dealers whether the appliance is sold by the dealer or the gas company.
2. The local dealer cooperative plan is built around conservative and soundly managed merchandising and advertising programs. Most of our advertising features utilization of modern gas equipment and the benefits to be obtained through modern gas equipment. We do not advertise sales. We lead in CP promotion programs and in the sale of better type water heaters and heating equipment. We encourage the dealer through keeping the market active and helping to stimulate the market through advertising and our direct sales personnel. We maintain sound merchandising policies with substantial mark-ups in line with dealer merchandising.
3. Local dealer cooperation in the past has been simple and very effective with the result that previous to the limitation orders our dealers sold about 80% of the ranges and water heaters sold in the territory. The gas company has taken the lead in selling only the highest grade merchandise at such mark-ups that dealers could readily compete with the gas company and make money. We believe that this is the formula for successful dealer cooperation. The dealers and the company do not sell the same manufacturer's product.
4. We have four franchised dealers who


PUBLISHED MONTHLY BY YOUR GAS COMPANY
VOL. 2—NO. 7
THE GAS FLAME
mmunition for the Home Front!
HOME CANNING BUILDS FOOD RESERVE FOR WAR PROGRAM
America needs plenty of "fighting food" to keep the wheels of production turning at full speed. You can do your bit by canning fruits and vegetables for use next winter. The modern gas range makes home-canning easy. Why not start now?

A bill stuffer campaign of this type (double horizontal fold) is being used effectively by a New England company. It is inexpensive, amounting to about ½¢ per customer

buy ranges and refrigerators at discount from the net retail price after allowances have been deducted. We install the merchandise for them, take care of all service and guarantees, make a home call, pay our salesmen full commission, and provide a time payment plan through our bank connections. Other similar plans are available to plumbers and heating contractors on water heating and house heating equipment.

5. Dealer cooperation includes the sale to dealers, for resale purposes, of ranges, water heaters, refrigerators and house heating equipment, as provided for under the various limitation orders of the War Production Board, at discounts that are comparable with those obtained in competitive appliances. We maintain frequent contact with our dealers, provide a floor plan wherein they may display gas appliances without investment, supply them with promotional materials, and make available to them our own display floors, where they may place orders directly with our own sales people for any gas appliances sold by the company. This plan has been in effect some years, and we are continuing without change, except insofar as restrictions on appliance sales have forced changes.
6. The company has had an extensive dealer development and dealer coordination program for the past 10 years. As a consequence the company was able to discontinue merchandising gas appliances about the middle of last year. At the present time, the company is running a number of ads urging customers to have their appliances and equipment repaired and reconditioned and suggest that they call their dealer right away to get this job done. In a number of instances dealers have tied in their repair ads with company ads urging the customer to call them to get the repairs done. Dealer coordinators endeavor to secure such tie-in advertising from dealers.
7. We have a plan whereby the Home Service Department girls make check-up calls on all dealers' range installations. Should the customer's appliances need further adjustment this is done through our Service Department. In the event a dealer sale develops into a baking failure our Home Service Department will take care of this complaint. We have developed a plan whereby the dealer may use our Home Service Department for cooking demonstrations in the dealer's store. That is usually done in a good location in the store where it will attract and stop store traffic.
8. Our dealer cooperative plan has necessarily undergone changes since the beginning of the war. These changes have been slight, however, as this company has always encouraged all gas appliance dealers in the promotion of merchandise. Our representatives continue to contact dealers in order to assist them.
9. The company, in the past, has realized the value of dealer outlets in the field. To lend support to the dealers the company has assisted in the appliance financing program, advertising subsidies, campaign subsidies, home service directors' assistance, prospect protection, etc.

SERVICE PLANS AND POLICIES

THE complexity of the service problem and its many ramifications are indicated by the variety and extent of policies now in force in the gas industry. In no two cases are reporting companies following identical policies in all respects. Lack of replacements, shortages of vital materials, transportation difficulties, and loss of skilled personnel have brought about many modifications in normal operating procedure.* Despite the general increase in servicing costs, there is widespread recognition of the fact that good service is a patriotic as well as a practical necessity.

Cooperation with other utilities is the keynote of one gas company's service policy. In this case, all requests for installation and connection of appliances, repair calls, etc. (except leak calls) are handled in conjunction with the work of other utilities in the city, including telephone and electric, with the complete approval of local tire rationing boards. This company has run advertisements identical with those of the other service companies carefully explaining that the purpose is to conserve truck and tire mileage.

Experiments with plastic tubing and fittings and semi-rigid metal tubing were reported but, unfortunately, the results of this experience were not given.

Programs to provide for the interchange of information between the Customer Service and Home Service Departments are becoming more numerous. These take the form of joint meetings to exchange ideas, cooperation in the preparation of educational booklets, classes in cookery for servicemen, and classes in servicing for home service girls. One company conducts a series of meetings for all contact people for the purpose of improving customer relations.

Among the service plans reported were the following:

1. Service all appliances, emergency service only on appliances not approved by A. G. A., complete service including procurement and installation of repair parts. No charge made for time of servicemen, charge made for material supplied if appliance has been in service beyond a reasonable free replacement period.
2. All customers' gas equipment inspected

* See articles reporting on previous surveys, A. G. A. MONTHLY, June and Sept. issues.

HOME SURVEY

Name_____ Folio _____

Address_____ Owner____ Rent____ Apt.____

No. in Family_____ Is Service In?_____ Is Hot Water Piping In?_____

App. In Use	Gas	Oil	Elec.	Coal	Coke	Age	Furn.	Pros.	Remarks
Range									
Refrigerator									
Auto. Water Htr.									
Tank Heater									
Laundry Stove									
Central Heating									Att. Toward Co.
Space Heaters									Good Fair Bad
Stoker									___ ___ ___
Furnace Hook-Up for Summer h. w.									No. Baths_____ Credit_____

Monthly Use Cu. Ft. _____ Rate_____ Cost _____

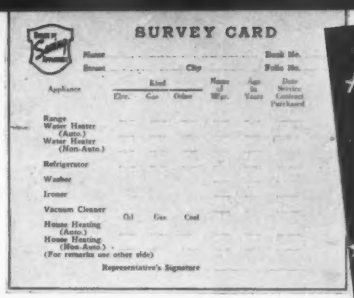
Comments: _____

A survey form being used to gather valuable market information

by service department, minor repairs made free of charge, major repairs made charging customers for time and material.

3. Free service upon request of customer for starts, shutdowns, regulations, check-ups and labor required for installation of repair parts for all gas appliances on company's lines. Repairs parts must be supplied by customer unless it is covered by manufacturer or company warranty and the appliance purchased from the company or one of its representatives.

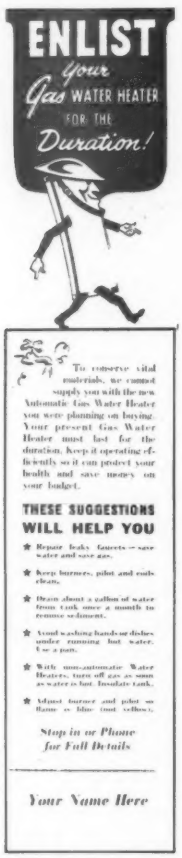
The following warranty periods cover domestic appliances purchased from the company: Ranges—60 days on porcelain parts, one year on all other operating parts, against defective material or workmanship; Refrigerators, retail—one year on working parts, wholesale, five years on working parts; Water heaters—one year unconditional and one year additional on controls. Manufacturers give 20 years on Monel and Evedur tanks; House heating—two years on working parts. A refrigerator maintenance agreement is available for wholesale customers at $2.00 per refrigerator per year and retail customers at $3.00 per refrigerator per year. This contract covers the unit, thermostat, burner, gas and water controls.



While introducing the unique U. S. A. (Utilized by Saving Appliances) plan to its customers, with a post-war saving angle, the Jersey Central Power & Light Co. expects to make a survey of all is customers using the card pictured above

4. Rate for charge service is $1.50 per hour from time serviceman leaves base until he returns. Free service on all appliances within the guarantee period. Use of U. S. A. (Utilize by Saving Appliances) plan in other cases; this plan explained elsewhere in this article.
5. Free adjustment work, free lighting of heating systems, emergency replacement of defective controls on heating systems for cost of material involved. All repair work is referred to contractors. All service work on refrigerators is done by distributor or dealers.
6. Service on house heating and water heaters free; service on gas refrigeration—Parts replacement contract, optional with customers. Retail, $3.00 per year; wholesale or apartment house owners, $2.00 per year, paid in advance. Replace any and all parts in cycle of refrigeration while under contract in good standing.
7. No charge for any service except on gas ranges. On ranges sold by company there is no charge for the first year; on all other ranges a standard charge of $2.00 per call for which the customer receives approximately one hour's work on the range. Service includes thorough cleaning and complete adjustment. Replacement parts are furnished at list prices. Specially trained men are used to furnish this service and the policy has been in effect since April 1, 1939.
8. Free adjustment service on all appliances up to ½ hr. of labor. Free service on appliances within the guarantee period. A schedule of fixed charges for maintenance and repairs to customers' equipment on all items where such charges are practicable. Material and labor charges on other repair and maintenance work based on: Material at invoice cost plus 30%; labor at $1.50 per man hour, truck time included.
9. Present policy is free labor on all appliances except house heating, with a charge for parts at cost plus 40%. On house heating after three-year guarantee period a charge is made for both labor and material unless covered by insurance contract at $10.00 per year.
10. Free cleaning, adjustments and inspection service upon request from the customer on all appliances in use. Repairs are charged at the rate of cost of parts and labor. Reconnecting cost of most appliances when customers move is $1.50 where the stub is in the kitchen. In the event a fuel line is to be run or there is a major job to be done, in accordance with priority regulations, the cost is at the rate of time and material. An annual cleaning and inspection service of all gas refrigerators connected on the lines is being considered. This would eliminate the peak demand for such service by the customer during warm weather, thereby, reducing service cost on gas refrigerators, and affording better public acceptance.
11. Maintain free adjustment service, provided that no material is used other than small miscellaneous parts, such as washers, bolts, orifices, etc., and provided that there is no hazard in connection with the use of the appliance. This policy is followed whether or not the appliance is sold by the company or is A. G. A. approved. A charge is made whenever material is involved, such as replacing door springs, burners and panels on gas ranges. Also a charge is made for lighting and shutting off appliances, with exception of house heaters. Removing stoppages from customers' house piping is on a charge basis.
12. Service policy has as its objective the directing of all regulating, adjusting and repairing of appliances to other agencies. Upon direct request of a customer, company will adjust and regulate gas and air on adjustable appliances, and will drain line of condensation if drop gage has been provided. If drop gage is not on line, customer is requested to have his plumber make necessary installation. All water heater adjustment and repair service is referred to existing repair agencies.

KEEP IT WORKING
MAKE YOUR
GAS Water Heater
LAST LONGER—SAVE MORE
That Gas Water Heater you were going to turn in for the latest Automatic Gas Model will have to last for the duration. Keep it in top-notch condition so it will last longer and save more money for you.
THESE SUGGESTIONS WILL HELP YOU
★ Repair leaky faucets — save water and save gas.
★ Keep burners, pilot and ends clean.
★ Drain about a gallon of water from tank once a month to remove sediment.
★ Avoid washing hands or dishes under running hot water. Use a pan.
★ With non-automatic Water Heaters, turn off gas as soon as water is hot. Insulate tank.
★ Adjust burner and pilot so flame is blue (not yellow).
Stop in or Phone for Full Details
Your Name Here


ENLIST
Your
Gas WATER HEATER
FOR THE
Duration!
To conserve vital materials, we cannot supply you with the new Automatic Gas Water Heater you were planning on buying. Your present Gas Water Heater must last for the duration. Keep it operating efficiently so it can protect your health and save money on your budget.
THESE SUGGESTIONS WILL HELP YOU
★ Repair leaky faucets — save water and save gas.
★ Keep burners, pilot and ends clean.
★ Drain about a gallon of water from tank once a month to remove sediment.
★ Avoid washing hands or dishes under running hot water. Insulate tank.
★ With non-automatic Water Heaters, turn off gas as soon as water is hot.
★ Adjust burner and pilot so flame is blue (not yellow).
Stop in or Phone for Full Details
Your Name Here

Two in a series of one-column 10-inch water heating advertisements made available to utilities and dealers by Whitehead Metal Products Co., Inc., 303 W. 10th St., New York City, water heater manufacturer. In addition to showing customers how to take care of gas water heaters, these ads are designed to keep the advantages of gas water heating before the public. No mention is made of any specific water heater. Mats are available at no cost

DON'T NEGLECT YOUR PRESENT GAS EQUIPMENT!
Take good care of it . . .
Uncle Sam wants it to last
A large proportion of the materials formerly used in gas appliances has been diverted to war production . . . for tanks, ships, planes, munitions, guns. Because of this fact, further gas appliance manufacturing will be greatly restricted. It will be necessary for all of us to make the best of what we already have. In most cases this will be easy, if certain steps are taken to prolong the usefulness and efficiency of our equipment. We must take good care of our gas appliances, and the time to begin is now!
We've prepared a small booklet on the care and use of your gas equipment. It's yours for the asking . . . absolutely Free. In it you'll find many worthwhile pointers on how to get the most from your present gas appliances. Ask for your copy when you visit your Gas Office.
ASK FOR FREE BOOKLET ON PROPER CARE AND USE OF YOUR PRESENT GAS EQUIPMENT
THE GAS COMPANY

Another advertisement which takes its theme from the "Uncle Sam Wants It To Last" booklet

Enlisted–
to save precious fuel!
★ Your storage water heater is playing an important part in the conservation of essential materials. First, it releases solid and liquid fuel needed for home heating. Second, it saves up hot water until needed. Third, it is amazingly high in efficiency and gets the most out of every ounce of energy. Your water heater can save you time and money. Use it efficiently
Buy U. S. Victory Bonds and Stamps
Keeps 'em Working
Our new Appliance Conservation Plan completely checks your appliances, puts them in top-notch economical working order and helps prevent breakdown when new appliances may not be available. Phone and learn how.
JERSEY CENTRAL POWER & LIGHT COMPANY
ENLISTED–
to save on FOOD BILLS!
★ In a dozen different ways, your Range saves money on food bills, saves precious vitamins, saves time for war work.
Automatic controls watch the cooking. Scientifically designed ovens and burners cut food shrinkage up to 20%, protect vitamins and make cheaper meat cuts just as delicious and just as nourishing.
Stop in and learn how to enlist your Range to help you save more and cook better
Buy U. S. Victory Bonds and Stamps
Keeps 'em Working
Our new Appliance Conservation Plan completely checks your appliances, puts them in top-notch economical working order and helps prevent breakdown when new appliances may not be available. Phone and learn how.
JERSEY CENTRAL POWER & LIGHT COMPANY

Typical advertisements used to introduce the U. S. A. appliance servicing program

An original new service plan known as the U. S. A. (Utilize by Saving Appliances) Appliance Conservation Program inaugurated by one company links the new business department, the service department and the customer, and has a unique post-war saving angle. The program revolves around a service policy signed by the customer and the utility representative which has the four-fold purpose of assisting the customer in keeping appliances operating efficiently during the war, conserving fuel and food, providing more complete and efficient gas service, and making an investment in gas appliances when the war is over.

The U. S. A. service policy provides that the company will service customers' appliances and keep them in efficient operating condition. Charges are made for servicing appliances, both gas and electric, as follows: $4.00 each for a gas range, refrigerator or water heater; $7.00 for any two of the above-mentioned appliances and $10.00 for all three appliances. Parts, where necessary and if available, will be supplied at regular prices.

The interesting feature of the plan is that a minimum of $10.00 and a maximum of $15.00 of service policies will be allowed toward the purchase of new appliances when they are again available. Allowances apply only to the same kind of appliance on which the customer has purchased service

WORK COMPLETION SCHEDULE FOR WAR EMERGENCY PERIOD:

Leaks—As soon as possible.
No Gas or Poor Supply Service Requests—Following day unless weather conditions prevent.
New Set—Day following receipt of Building Department certificate, unless future date specified.
Reset—Same as new set.
Unlock—Same as new set.
Unlock—Following day unless future date specified. Non-payment.
Lock—Private (one tenant) houses following day unless future date specified. Other locks—within 10 days.
Change Meter—Following day unless future date specified. P.S.C. or Consumer's request.
Bookkeeper's Orders—D.N.R. Inspections—10,000 cu.ft. per month or more 3 days. Remove B.L.M.—3 days—other types—30 days.
Refrigerator Service Requests—Day following receipt of order, unless future date specified.
House Heating Service Requests—No heat—same day. Won't shut down—2 hours. Other service requests and starts—following day, unless future date specified. Shut downs—when convenient, unless future date specified.
Water Heater Service Requests—Won't shut down—2 hrs. Other service requests following day.
Range Service Requests—Following day, unless future date specified.
Connect Appliances—Day following delivery.
Connect Industrial Appliances—No time schedule.
Miscellaneous Orders—Following day, unless future date specified.
New Service—No time schedule; in 10 days generally.
Ind.-Comm.—Industrial and large commercial service requests affecting operations —same as leaks.

Emergency work schedule used by a large eastern gas company

JOIN THE "MAKE 'EM LAST" CLUB!
TAKE CARE OF YOUR AUTOMATIC GAS WATER HEATER

Many homemakers do not realize how extremely valuable the home appliances they now possess have become. NO MORE ARE BEING MADE! In addition, as time goes on, more and more men may be called into the armed services, and the supplies of gasoline and rubber now used in transportation to service appliances may become less and less. Therefore, if you value the service of your appliances, it may be up to you to keep yours in good repair. *There are many little things you can do to extend the useful lives of your equipment.* Let's learn to do them, then!

The **FIRST RULE** to insure good service over a longer period of time is to always keep your appliances clean . . . and here are a few suggestions for the occasional cleaning of your automatic gas water heater:

AUTOMATIC SIDEARM WATER HEATER

To clean coil and burners:

This type water heater has a door which opens the vertical length of the heater. Open it and you will see the coil, the burner and the pilot light.

(a) Turn off main burner cock (A). (Gas cocks when "on" are parallel with the gas line—when "off" they are at right angles)

(b) Turn off pilot cock (B).

(c) The main burner sets on top of a pipe or venturi and the connection between the burner and venturi is a slip joint. Make certain the burner is cold enough to handle easily. Then lift it up and slip off this joint. Remove from heater and turn upside down on a piece of paper

(d) Place a piece of newspaper in the bottom of the heater where the burner was removed and gently brush coil surface removing accumulated dust and dirt. (Care should be taken not to get dust and dirt in eyes and nose) Remove newspaper and collected dirt.

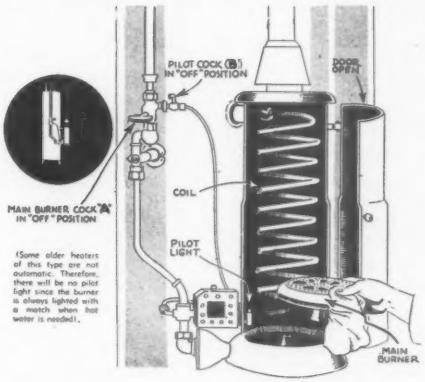
(e) The burner should now be cleaned. Tap it sharply several times in upside down position, then brush with a stiff brush.

(f) Clean pilot light burner tip with a stiff brush.

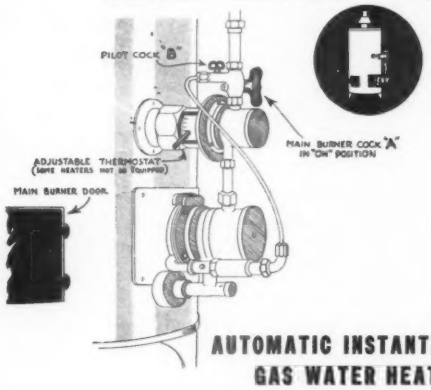
(g) Replace burner.

(h) Turn on pilot cock (B) and light pilot with a match.

(i) Turn on main burner cock (A). The safety pilot will light the main burner when warmed up sufficiently. This should take from 3 to 5 minutes.



(Some older heaters of this type are not automatic. Therefore, there will be no pilot light since the burner is always lighted with a match when hot water is needed).



AUTOMATIC STORAGE WATER HEATER

To clean main burner and pilot:

In this type heater the main burner is located in the bottom. It is made accessible by a door. Open this door, which may be a single door or a door split in the middle, and there you will see the burner and the pilot light.

(a) Turn off main burner cock (A). (Gas cocks when "on" are parallel with the gas line—when "off" they are at right angles).

(b) Turn off pilot cock (B).

(c) The main burner and the pipe or venturi connected to it is supported in a sort of cradle at the burner end of the pipe and is connected to the gas supply pipe by a slip joint at the other end. Make certain burner is cold enough to handle easily. Then lift out of the cradle and slip off slip joint. By manipulation you can then remove it from the heater Turn upside down on a piece of paper and tap sharply several times. Brush with a stiff brush.

(d) Clean pilot light burner tip with a stiff brush.

(e) Replace main burner

(f) Turn on pilot cock (B) and light pilot with a match.

(g) Turn on main burner cock (A). The safety pilot will light the main burner when sufficiently warmed up. This should take from 3 to 5 minutes.

AUTOMATIC INSTANTANEOUS GAS WATER HEATER

To clean main burner and pilot:

This is the type of heater which hangs on the wall. The burner and pilot are exposed by removing the outside case.

(a) Make certain hot water faucets **throughout** the house are turned off.

(b) Turn off main gas cock (A), and pilot cock (B). (Gas cocks when "on" are parallel with the gas line—when "off" they are at right angles)

(c) Remove outside case by removing fastening screws. There are 8—4 on top and 2 on each side.

(d) The main burner consisting of 5 small tubes sets close under the inside shell. For cleaning you can reach it with a small stiff brush.

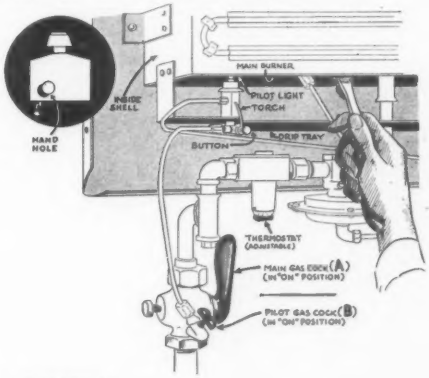
(e) The pilot light is also located under the inside shell, and the tip should be cleaned with the brush.

(f) Remove dust and scale from drip tray (To make main burner more accessible for cleaning, this tray may be removed by loosening the two screws which hold it).

(g) Replace outside case.

(h) Turn on pilot cock (B) Through handhole provided in outside case (some models may have this on the right hand side) depress button and light the torch with a match. Keep button depressed until pilot light goes on. This may take a minute or longer. Then release button.

(i) Turn on main burner cock (A)



FIRST AID IF YOUR PILOT LIGHT GOES OUT . . . . .

For any of the above heaters, proceed as follows:

(a) Turn off main burner cock (A), and pilot cock (B).

(b) Wait **at least 5 minutes** for any gas that may have collected in heater to pass up the flue.

(c) Turn on pilot cock (B) and light pilot as per instructions above.

(d) After pilot has been lighted, turn on main burner cock (A).

(e) If main burner does not light after 5 minutes turn off main burner cock (A), and pilot cock (B), and call your plumber.

GENERAL

TO DRAIN SEDIMENT from sidearm or storage type water heaters, draw one or two pails of water from the tank each month. Faucet is located on the side near the bottom of the tank.

TO ADJUST TEMPERATURE OF WATER, some water heaters are equipped with an adjustable thermostat. If yours is so equipped you will see a lever or a dial. Adjust toward hot to increase temperature, toward cold to decrease temperature. (See sketches of Storage and Instantaneous Water Heaters above).

The lowest water temperature which will give you satisfactory service should be used, since this permits most economical use of the heater and requires least hours operation of the equipment.

If YOU DESIRE MORE SPECIFIC INFORMATION IN REGARD TO YOUR OWN WATER HEATER, SEE YOUR PLUMBER AT YOUR FIRST OPPORTUNITY.

CENTRAL HUDSON
GAS & ELECTRIC CORPORATION
"Serving the Central Hudson Valley"

LISTEN — to the Central Hudson FAMILY NEWS on the Air . . . . !
9:30 A. M.—WKNY—Kingston
10:30 A. M.—WGNY—Newburgh
10:55 A. M.—WKIP—Poughkeepsie
Send your news to the women's reporter

An outstanding example of informative advertising

policies. The customer may pay cash or $1.00 down and $1.00 per month per policy. The utility expects to benefit by maintaining customer satisfaction, balancing service costs, saving time and rubber by planning servicing calls by book and folio sequence, and obtaining a complete census of all appliances on the company's lines.

House Heating Service Plans

Special attention has been paid to house heating service plans and a number of innovations are reported. For example, one utility plans to use young women from the office to turn on and off customer's house heating equipment at the beginning and close of the heating season. In general, turn-ons and start-ups are being limited to one each season and charges for additional services are contemplated. The starting of house heating installations will be undertaken on a routine plan by territories in some companies.

Following are some interesting plans:

1. We contemplate establishing a charge for house heating service but there is some question whether O.P.A. regulations will permit. The alternative may be to cease all service work and have it done by plumbers. We believe approval can be secured if such service plans are set up as yearly maintenance agreements insuring customers against failure of boiler sections, controls, thermostats, etc. on a free replacement basis in lieu of an annual charge of approximately $20.00 on boilers and furnaces and $15.00 on conversion burners.

   In the case of conversion burners only parts of the burner and controls themselves would be eligible for free replacement under the contract as it is not deemed advisable to insure sections in many of the coal boilers and furnaces which are suitable for conversion to gas equipment. For customers who do not care to sign an annual maintenance agreement, we would prefer a charge of about $3.00 per call. In any event we would do the turn-ons on a no-charge basis. The above plan is awaiting definite determination with O.P.A.
2. Plans are now being formulated under which house heating customers will be notified that the starting of house heating installations will be undertaken under a routing plan by territories. Customers will be notified that turn-ons or start-ups will be limited to one for the season and a system of charges for additional service is now in contemplation.
3. It has always been our policy to turn off house heating equipment early in the summer and clean the burners and make other necessary adjustments. This is routine and covers our entire heating customer list. Heaters are again turned on and checked in the Fall. This will be continued. In addition, since we are now taking on no further heating customers, we will direct the attention of our heating salesmen to an intensive checkup of all heating installations.

   We really plan to re-engineer each job, making sure the equipment is adequate, that no undetected errors have been made in installation, and that to the best of our knowledge the equipment is operating under conditions that should make it a good advertisement for the heating service we are selling. Orsat tests will be run where needed and consultation with customers will be made necessary. It may also be that peak conditions may force us to interview customers where automatic equipment is installed with the idea of having the equipment come on at some period before or after our natural peak.
4. A plan is offered to customers whereby the company will inspect, clean and adjust heating equipment for a nominal charge. This plan is aimed particularly to users of floor furnaces and automatically controlled and vented heating equipment. This is not a special plan for the emergency, but the work will be intensified during the emergency for maintaining the efficiency and condition of customer's heating equipment to assure satisfactory usage.

Dealer Service Plans

While the majority of the companies report that they do not utilize local dealers in appliance servicing work, several companies indicate that this policy has been effective. The work done by dealers ranges from all appliance service and repair work in one case to servicing such as changing refrigerating units and replacing coils, etc. on water heaters. In most cases reporting in the affirmative on this question, dealers service their own installations, although in some instances this service extends only for one year. Those utilizing dealer servicing report that this practice has greatly lessened the load on their own service departments.

One report emphasizes that minor servicing such as lighting pilots and adjusting air mixers can be done in many cases by the customer after explanation by a company employee. Other service work can be rendered more efficiently by neighborhood gas appliance servicemen. It is maintained that the establishment of service stations in different sections of cities has greatly speeded up this type of work and has cut down the number of calls to the gas company.

Assisting Dealers

The vital necessity of maintaining dealer outlets for post-war sales requirements has caused many companies to devote considerable effort to aid these dealers during the sales moratorium. Assistance to dealers has been given in various ways, such as: conducting servicing and repair schools; directing repair and installation work to dealers equipped to handle this type of business; helping them to secure additional lines of merchandise; and maintaining close contact in order to work out their individual problems and retain their good will. One company maintains collection agencies in dealers' stores and pays rent for this privilege.

Reconditioning of Appliances

Another new trend brought on by the war is reflected in the increasing consideration of programs for reconditioning gas appliances. Not a few companies already have taken steps to place all workable and serviceable gas equipment back on the lines when new equipment is unavailable. One utility is planning the refurbishing of gas ranges to be sold at $20.00 or $25.00, including connections. Others are reconditioning all appliances repossessed from the customer and still others are reconditioning appliances on the customer's premises on a charge of cost and parts basis. In certain territories large scale advertising is being used to stimulate a dealer repair and reconditioning service. The same policy is being followed in connection with commercial and industrial equipment.

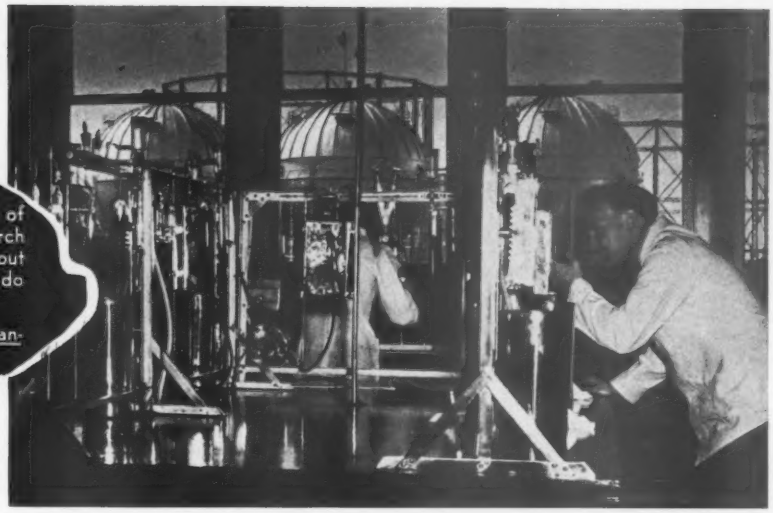
Transportation

Conservation of motor equipment to alleviate the shortage of rubber and critical materials has resulted in a revaluation and re-grouping of many activities which were heretofore general practice. Ordinary service orders are being held to permit regrouping and save mileage, but

emergency calls are still answered promptly. Some companies are instructing customers over the telephone how to do simple service work for themselves and checking back to see whether it has been satisfactorily done. The training of older men and, in some cases, women to do certain types of service work appears to be a new trend. The use of bicycles and, in one instance, a horse, were reported to augment motor transportation.

Charles F. Kettering, Vice President of General Motors, once termed research an organized program for finding out what to do when you no longer can do what you are doing now.

His words have taken a vital new meaning today.



One utility uses the following six point plan: (1) All departmental units were analyzed as to mileage and assigned definite quotas requiring written explanation if exceeded. (2) All motor units were tested for efficiency and repaired fully. (3) All trips are combined by use of a dispatching center. (4) All mail and money pick-up routes were revamped using mailing where possible. (5) Collectors were put on foot and collection effort scaled down to meet this operation, thus eliminating many units entirely. (6) Manpower shortage caused shifting of personnel to different departments and in some cases extension of work week.

Installation of appliances in one territory is being made by gas company men but deliveries are made by a local trucking company. Service trucks make only one trip a day into a given territory and if the customer is not at home a follow-up call is made the following day. In remote sections, service trucks make only three trips a week. Another utility has divided its entire personnel into 8 divisions and every 10 days each division is given a detailed report of their mileage totals. This procedure with its numerous ramifications has resulted in a 30% decrease in automobile mileage.

RESEARCH

IT is apparent that the gas industry recognizes the importance of research as the reporting companies were unanimous in their belief that research is imperative. It was generally felt that the American Gas Association should coordinate and supervise the research work of the gas industry. Among the branches of the industry specifically named to conduct research projects were the American Gas Association Laboratories, Institute of Gas Technology, the utilities and the gas appliance manufacturers. Several companies contended that research should be done by the manufacturer but the majority thought that it should be undertaken cooperatively with the utility and coordinated nationally.

Following are typical comments:

1. "Research, of necessity, must be made both by the manufacturer as well as by the gas company. We believe that under present circumstances the A. G. A. Testing Laboratories has nowhere near the amount of testing of appliances to do today, leaving considerable time to make use of the facilities for the purpose of research work. We believe that every possible help the A. G. A. Laboratories can give should be utilized in cooperation with the appliance manufacturers and the gas utilities to find out what the public needs and what it wants in the post-war era, and to develop such equipment and service which will do the gas industry the greatest amount of good."
2. "Further improvement can and must be made in gas ranges. Broiling can be improved—oven heat can be further retained—some enamel parts still discolor and ranges could be more firmly constructed. Some of these are problems for manufacturers to solve during this breathing spell and such fundamentals as improved burner efficiency, better baking results, and more perfect types of broiler burners, such as ceramics, could be worked out in an impartial laboratory such as the American Gas Association Laboratories. Improvement in appearance must be sought in all appliances because with the manufacturing facilities, the inventive imagination and the wealth of new materials which will be released after the war we can easily be outclassed by an aggressive, far-sighted competition unless we have taken strides in the interim to perfect our present position. CP standards should be more stringent."
3. "We believe that pure research on gas and on gas appliances, where there is no immediate prospect of a financial return, should be done by the gas industry, preferably through the American Gas Association Laboratories. We believe that the intermission in appliance manufacture caused by the war could be utilized by the A. G. A., in doing basic research work in appliance design, with the results of such research available to all manufacturers."
4. "From all that we hear our competitors, the electric, coal and oil industries have already made tremendous advances in the development of new appliances for using their fuel. The coal industry, for example, has developed what apparently is a

practical smokeless heater. The electric industry has no doubt made just as profitable strides. If we in the gas industry expect to be able to compete with these other industries immediately after the war, then we should be doing something about the known faults which exist in connection with our appliances, industrial, commercial and residential, and we should by all means then engage in strenuous research looking toward new uses of gas itself."

5. "Research work should be undertaken to further improvements of residential, commercial and industrial appliances. Also development and improvement of gas producing methods. Development and improvement of tools used in laying gas mains and services."
6. "We believe that further research could be made from the standpoint of premix burners that would eliminate a considerable number of service calls from the standpoint of adjustments and cleaning."
7. "We should conduct surveys to determine what our customers want in the way of equipment after the war
   a. In the way of improvement over present equipment.
   b. In order to develop new uses, such as laundry dryer and gas air conditioning.

   "Research should be directed by committees as presently organized with regular contacts with all branches of the industry."

Specifically, it is suggested that research and development should be undertaken as follows:

1. To reduce the production and distribution cost of gas refrigerators and to improve their inside appearance.
2. The development of a gas range with distinctive and exclusive new features and conveniences so that gas cooking will dominate the post-war market.
3. Improvement of the efficiency of all gas burning equipment with special effort toward the elimination of constant burner pilots and the improvement of control equipment.
4. Improvement of the accessibility of unit assemblies to assist in simplifying service problems and facilitate replacement rather than making necessary long periods of work and adjustment in the customer's premises.
5. Research in combustion and burner design.
6. Research by manufacturer to ascertain if better types of heating equipment can be put in hands of the low income customer.
7. The development of an improved method of lighting top burners, oven and broiler burners from a central pilot on the top of the range.
8. Development of ways and means of converting coal and oil to gas more economically and to increase appliance utilization and efficiency.
9. The improvement of the appearance and efficiency of gas water heaters and the lowering of installation costs.

Several companies are actively engaged in their own research activities. One company has conducted a two-year study on house heating research, and contemplates several years additional study on this project. A five-room house has been built on company property constructed in such a manner that various types of furnaces may be installed both in the basement and above the floor (closet-type forced air furnaces) and the results of different areas of ducts and heat distribution studied and analyzed. Another project recently completed by this company involved the study of special vent cowls which may be installed in concealed locations on a roof and still promote good draft.

Other individual utility research includes: new uses of gas, gas tubing and outlet connections, base load studies, rate studies, and a project on tankless water heaters, utilizing conversion burners and boiler equipment with tankless water heaters.

POST-WAR PLANNING

WHILE most units in the gas industry recognize the vital necessity for post-war planning to meet the stepped-up competition of that era and to prepare for the inevitable dislocation of industry, some companies believe that it is too early to lay out a definite program. It was the consensus of all, however, that if the gas industry renders efficient and satisfactory service now, its customers will become boosters of gas in the post-war period. Without exception, the companies are exerting every effort to that end and are also attempting to maintain a nucleus of their sales organizations for post-war action.

Companies which are taking positive steps to improve their post-war position are doing the following:

1. Using this period to develop previously tested sales plans in readiness for the post-war period.
2. Cooperating with the Chamber of Commerce in formulating plans for the continuance of industrial activities at the end of the war.
3. Appointing committees for carrying on research work, improving customer relations and employee training.
4. Continuing gas fuel promotion in a patriotic but effective way so that both the old and new generations will understand the capabilities and possibilities of gas.
5. Canvassing all customers and many non-customers to ascertain their fuel needs in the post-war period.
6. Analyzing markets with a view of obtaining better balanced gas loads.
7. Studying the development of newer uses of gas such as air conditioning.
8. Compiling a case history of all competitive fuel installations for utilization in direct mail campaigns and reorganized sales force.

There was strong support for continuation of the national advertising campaign on a large scale. It was also felt that all possible work should be done on the development and improvement of appliances, both new and accepted. It was urged that every effort should be made to get maximum performance at a minimum of appliance cost since price probably will be more important than ever after the war.

One report stated that it was essential "to build up water heater sales, particularly for summer service as a balance against house heating protection in winter months and to develop commercial and household use of gas equipment for dehumidification." It was emphasized by many that something effective should be done about water heater sales, perhaps along the line of the successful national gas refrigeration and CP range campaigns. Sustained national promotion of this service was strongly urged.

There was some difference of opinion concerning the effectiveness of the CP program although the preponderance of thought was for its continuance in the post-war period. In this connection one report made the following recommendation: "The A. G. A.'s CP Range Committee and other members of both the A. G. A. and the A. G. A. E. M. should study the CP range program so as to im-

prove it in line with suggestions turned in by various gas companies in different parts of the country. . . . This same committee or another committee should do some research on improving domestic water heaters in appearance and performance. We need a CP water heater program or something similar to promote this service. We would like to see the A. G. A. and A. G. A. E. M. provide some plan for selling 'certified gas heating' in all types of residential homes."

Special attention was given to the future of the house heating load in the post-war era, and many companies are concentrating on keeping their present customers sold on gas heat and are also maintaining contacts with dealers, architects, builders, plumbers and other interested parties. It is generally agreed that the house heating load in the post-war period will largely be dependent upon the price of competitive fuel and the development of gas utilization equipment.

Gas Heating Acceptance

In the opinion of one, "the present trend toward residential gas house heating, caused by the acuteness of the fuel oil situation, will undoubtedly create some favorable effect in the acceptance of gas as a house heating fuel, but the load cannot be retained unless more competitive rates can be offered, or the gas equipment can be increased in efficiency so that the competitive operating cost differential can be lessened.

"The acceptance of residential gas heating by operative builders, although influenced by the fuel oil situation, can be further developed if this class of business is properly nurtured in the post-war development period. This will include the promotion of effective building insulation and proper installation of house heating equipment." This report also called for some means of controlling effectively proper installation of gas-fired heating equipment in residential home building projects.

An opportunity which should not be overlooked, according to one source, is that of obtaining a strong dealer organization selling house heating after the war. In this viewpoint much depends on how well competitors coordinate their efforts to regain the position lost during the war.

The outlook for gas house heating was well summarized as follows: "The future looks good provided we do not neglect it." This same conclusion could well be applied to the entire post-war prospects of the gas industry. However, the industry cannot reap its reward without first laying the seeds of sound planning and concerted effort. Here's what one company believes must be done:

"The gas industry, both utilities and manufacturers must be ready to play a prominent part in the drive for new markets. We must be on the offensive, not the defensive and we must be ready to go at the conclusion of hostilities. This means study and research. It means new and improved products and aggressive promotion. The planning must be done by all units of the industry for 'D' (demobilization) Day." In other words, you can't have a blitz-krieg or any victorious campaign, sales or otherwise, without planning, organization, materials, and ACTION.

Nutrition Plan Wins National Support

A NATIONAL advertising campaign in leading weeklies and business publications as well as women's magazines, having a combined circulation of more than 35,000,000, is giving further, powerful impetus to the advance interest and editorial backing already accorded the "Nutrition in Industry" plan which Servel, Inc., of Evansville, Ind., has developed for war industries everywhere through the gas utility companies, to help speed the nation's war production drive.

Here are the magazines carrying the "Nutrition in Industry" story to war plant executives, wives of war workers, and the domestic gas consumer public in every section of the land, graphically telling what the plan is, what it will do, and how it will do it:

Saturday Evening Post, Time, Newsweek, Business Week, United States News, Factory Management & Maintenance, Modern Industry, Life, Collier's, Better Homes & Gardens, American Home, Good Housekeeping, Ladies' Home Journal, Woman's Home Companion, McCall's, Look, True Story, Fortune.

Objectives of the campaign are threefold:

1) To tell the war plant executive about the "Nutrition in Industry" plan and how it will help to break the lost-time bottleneck in his war plant; 2) to tell wives and mothers of war workers about the plan and how they can contribute to it; 3) to tell "customers" of the gas industry the job which the industry is doing and the wartime service it is rendering through the "Nutrition in Industry" plan. The plan has been developed in support of the government's industrial nutrition campaign recently announced, and is a program for keeping war workers healthy and on the job by guiding their eating in the plant cafeteria, the plant neighborhood restaurants, the home packed lunch brought to the plant, and at home.

The drive for better eating habits in the war plants of the nation will receive editorial support from some of the best known writers on food and nutrition in the United States, many of whom visited the Servel plant and cafeteria in Evansville recently and saw for themselves the actual operation of the "Nutrition in Industry" plan as it is carried on by Servel for the employees in its own factory, now converted to 100% war production.

At the speakers' table during a preview of Servel's Nutrition in Industry program—Left to right: North R. Townsend; C. V. Sorenson, A. G. A. Refrigeration Committee Chairman; Dr. Robert S. Goodhart, Washington, D. C., nutrition authority; George S. Jones; Louis Ruthenburg, president, Servel, Inc.; C. B. Enlow, civilian defense director; and W. E. Baker

This 1929 flivver was part of the 100 tons of scrap metal and rubber contributed by employees of The Brooklyn Union Gas Co. in a "Scrap for Scrap" campaign. Jack Frost, industrial sales manager, who donated the car, is at the wheel and Joseph Foster, who weighed the scrap, is holding the scale

Vast Quantities of Scrap Metal Donated in Utility Campaign

A FINE example of what can be done in obtaining scrap metal to aid the war effort has just been demonstrated by the 4,200 employees of The Brooklyn Union Gas Company. A three-week "Scrap for Scrap" in which these men and women ransacked their cellars and attics for unused and outworn articles containing rubber or metal netted more than 200,000 lbs. of copper, brass, zinc, aluminum, rubber and other materials most urgently needed by war plants.

Sylvester Valentine, a despatcher in the Queens Service Station, for example, donated 216 pounds of tin foil collected over a period of seven years. The foil came from the wrappers of 59,400 packs of cigarettes, which he obtained from fellow employees. A veteran of the last war, Mr. Valentine said he saw the present struggle looming in 1935 and, anticipating that tin would be needed, began his collection.

The goal was set at a contribution of 10 pounds from each employee but so much enthusiastic support was received in the form of individual contributions running into hundreds of pounds that the original goal was achieved at the end of the first six days of the three-week campaign.

Irene Cramer, a General Office stenographer, dismantled a 25-year-old gas range with her own hands, packed it in the trunk of her car and with many other items arrived at one of the sixteen salvage depots to add 390 pounds to the collection.

John Dowd, a collector, employed at the Nassau Office, made a tour of his neighborhood shoe repair shops, and quickly rounded up over 2,200 pounds of rubber in the form of over 24,000 old rubber heels, which he added to the Nassau Office pile.

Several automobiles, at least one of which had tires still good for a few thousand miles, were contributed. Jack Frost, industrial sales manager, contributed a 1929 Ford roadster, which had driven him a minimum of 175,000 miles. The tires, he guessed, were of little value except for their rubber, because they were made for the old style clincher rims.

George Mehring, a service man, contributed 50 old radio sets which he had collected from neighbors. Many employees junked World War I relics, some made of bronze and brass. A 110 mm. shell bearing German markings was among these trophies.

Also included was a pair of old gas light fixtures, among the earliest ever installed in Brooklyn, which once were used in the home of the late James H. Jourdan, former president of the company.

Old typewriters, lighting fixtures, motors, skates, coin banks, gears, grates, keys, tire chains, stoves, bathroom fixtures (including at least one tub), golf clubs, garden hose and even girdles were among the varied assortment of articles thrown on the scrap heap. One man rounded up 40 baby carriages. Another brought in about 40 pounds of rain rubbers. Still another turned in about 300 pounds of gymnasium equipment, including a rowing machine and a wheelless "bike."

"This drive, involving only the company's own employees, shows what can be done on a city-wide scale once the public realizes the necessity of collecting every available pound of scrap and are provided a plan for getting it on its way to the war plants," said Assistant Vice-President George F. B. Owens, who directed the utility's campaign.

"Many of our people went to extreme lengths—carrying large and heavy parcels on subways, buses and trolleys—to get their scrap to the salvage depots."

No Idle Hands

Planned as an interim arrangement for surplus employees in sales, service inspection and stores departments, one gas company has created a Salvage Bureau to absorb these people. The bureau is making a real contribution to the war effort.

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8 Million Women Aid Britain's War Effort

ONE of the outstanding industrial features of war-time has been the willingness of women to take up productive occupations with which they were but yesterday entirely unfamiliar and their smart adaptability to assimilate all that was requisite in performing new jobs. In one form of service or another, more than eight million women are helping Great Britain to win the war, a prodigious force, able from the outset and daily picking up speed and knowledge in new and old processes.

"Woman has proved a trump card in a situation of unexampled difficulty, and her industrial education is but yet in its infancy. This army of women workers does not by any means operate in tasks obviously within the scope of female intelligence and industry, it stretches much farther into unaccustomed fields; into the steel works, the ship yards, the engine shops, heavy industries which previously would not have been deemed appropriate for fair hands to engage in. But it is the women themselves who have brought conviction in their desire to do a hard job and prove their competency in it.

"Very many thousands of women are in the munition factories working hard every day, but I have alluded to the newer kinds of work to show the versatility of female labour and the astonishing readiness with which some of the heaviest of operative tasks have been tackled and successfully overcome."

—T. D. YOUNG, in a letter from England to Davis M. DeBard, August 27, 1942

Milestone of Progress . . . *New Building Marks Growth of Washington's Gas Service*

CLIMAXING a series of developments which in recent years have made it one of the more important utilities of the country, the Washington Gas Light Company has just completed and occupied a new general office building. In the heart of downtown Washington—Eleventh and H Streets, N. W.—it is the city's newest commercial structure and embodies the most advanced construction methods and materials.

This new home of the Washington Gas Light Company could easily be one of the show places of the industry. At present urgent utilitarian motives, in keeping with the times, prevent fulfilment of all its possibilities. The company, in deference to the District's critical floor space shortage, has temporarily accommodated itself to condensed quarters; emergency war offices of the government occupy several floors of the 12-story edifice.

One of the President's administrative agencies is taking over the familiar red brick building at 411 Tenth Street, N. W., home of the Washington Gas Light Company for 76 years. This "venerated old building"—in the words of a contemporary newspaper—"possesses an old world charm" which made it a pleasant place to visit—even to pay a bill. Since the observer attributed that charm in great part to a tradition of courteous service from which the company has never departed, some measure of it should transfer itself to the new abode.

Through the years the Washington Gas Light Company had experienced a pressing need for larger quarters which piecemeal extension only temporarily alleviated. Moving to the Tenth Street site while still a teen-age corporation, this company early began its physical expansion. The antiquated red building itself assumed final form through addition upon addition—like old Canterbury Cathedral. In 1928 a new service building at 1100-29th Street provided some new space for offices; a further increase was acquired in a merger with the Georgetown Gas Light Company in 1936, and a few years later an overflow office at 13th and F Streets was established for the bulk of Accounting forces. The latter two locations are now released along with the Tenth Street property, further augmenting the supply of available floor area for government and other essential purposes.

The new building was completed in the face of material, transportation, and labor stringencies, though not without some delay. It represents a substantial contribution to facilities for Washington's war program as well as meeting the company's *own* urgent demands. Construction was started prior to Pearl Harbor when most of the supplies and equipment for it were already on order.

The change of quarters affecting a number of departments in various locations was in the nature of a major move. The gas company's own transportation department performed all the hauling and necessary rigging on a closely organized schedule. The final cutover was accomplished between Saturday closing time, up to which hour business was conducted at the old location, and Monday opening time when it was resumed in the new one. This occurred without serious interruption of any department function or any lapse in customer service.

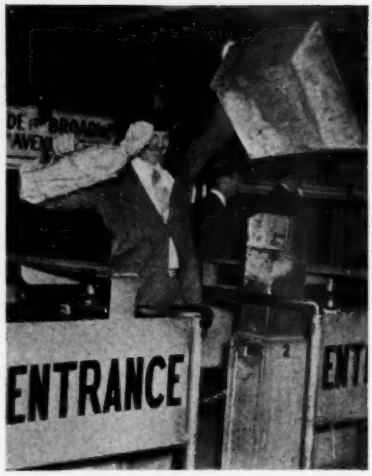
No fanfare accompanied the opening, public announcements taking the

Tradition gives way to Progress. The old and new buildings of the Washington Gas Light Company

form of a simple bill enclosure, a modest newspaper ad, and brief references in a standing institutional radio program. Space in the display lobby at the opening was allotted to the American Red Cross and various other war time agencies with uniformed workers in attendance. The Servel Home Volunteers program for Washington was fittingly inaugurated at booths presided over by home service representatives. An unpremeditated air of festivity was bestowed upon the quietly appointed lobby by a profusion of flowers from friends throughout the country.

Acquisition of this modern building comes at a time in the life of this 94-year-old company when demand for its service had reached a towering level. War agencies have brought new hundreds of thousands to the metropolitan area of Washington in the past 4 years, swelling its population to well over a million. The District proper has doubled its World War I population, now having 850,000 inhabitants against a high of 421,000 for the earlier period. Workers in the executive branches of the federal government at Washington had reached the staggering total of 117,760 on Armistice Day, 1918; today, that figure is in excess of 260,000. To cope with the gigantic problem, the Washington Gas Light Company had been expanding its production and distribution facilities as rapidly as existing conditions would permit. House heating demand is particularly heavy in the Washington area where—excepting those of recent months—more than 50% of all new dwellings employ gas furnaces. Thirty thousand individual house heating installations are now on the lines.

It is a far cry from the Washington Gas Light Company of nearly a century ago with a capitalization of $50,000 to the present institution with its fixed capital of more than $40,000,000. Then, a few hundred straggling meters furnished "illuminating" gas only—at $8.00 per Mcf; now, through nearly a quarter of a million meters along 1700 miles of main, flows the preferred fuel for rendering a variety of vital home services at an average rate of $0.74 per Mcf. Employees of the present company number 2,200 and its annual payroll is $4,200,000.



Bus, train and subway failed to stop Willard C. Wolff, assistant commercial manager, The Brooklyn Union Gas Co., from donating his share of old scrap to the utility's highly successful salvage campaign. For results see page 358

This company, one of the six oldest in the country, has contributed to the industry's progress in engineering, accounting methods, sales promotion, personnel practices and operation. Its new headquarters, typifying the growth it has obtained, may be considered among the mileposts of the American gas industry.

The new building of the Washington Gas Light Company was designed by Jarrett C. White and Leon Chatelain, Washington architects, and the general contractor was the James Baird Company, Inc. Consulting structural engineers were Marshall and Gongwer and William J. Karsunky was the consulting mechanical engineer.

65-Foot "Orange" Just a Gas Holder

RIVERSIDE, California, now has an orange 65 feet 8 inches in diameter, gift of Southern California Gas Company. It happens to be full of natural gas, but otherwise it is a perfectly authentic-looking orange, down to a spot of discoloration such as occurs when a wind-fall lies on the ground for a time.

This gigantic advertisement of the chief product of the region is the result of a friendly bit of collaboration between the gas company and an inspired member of the local Chamber of Commerce, who saw that the only thing required to make the hortonsphere holder, built at the Riverside holder station last year, look exactly like an orange was a coat of paint. It took 140 gallons of paint to do the job, but already, according to local people, it has become a Riverside landmark.

The color is a deep orange, quite similar to a well ripened navel orange. A large navel, painted in green at one side near the top, adds an orange-like touch. The seams where the plates of the steel shell are welded together have been shaded to resemble the segments of the fruit, and even the large pores on the skin are simulated by incomplete circles painted with light yellow pigment.

The hortonsphere, first of its kind built on the Pacific coast, is constructed of welded steel plates, only a few thousandths less than one inch thick. Having a rated capacity of 554,900 cubic feet, it weighs around 600,000 pounds and is supported on four large reinforced concrete piers set in a pit from which 1071 yards of material were excavated.

Alfred Schoellkopf Dies, Niagara Hudson Head

ALFRED H. SCHOELLKOPF, president of Niagara Hudson Power Corporation, died Sept. 9 after several months' illness. He was 49 years old. He died within an hour of the death of his uncle, Jacob F. Schoellkopf, president of the investment firm of Schoellkopf, Hutton & Pomeroy, who was 84 years old.

Mr. Schoellkopf, regarded as one of the outstanding public utility leaders of the country, had been president of Niagara Hudson Power Corporation since 1933, and previously had been president of Buffalo, Niagara and Eastern Power Corporation since 1929. He had been associated with the Niagara Hudson System and its predecessor companies for the past 27 years.

Mr. Schoellkopf was chairman of the New York State Board of Social Welfare and president of the Welfare Council of New York City, and was formerly chairman of the New York State Temporary Emergency Relief Administration, having succeeded Harry L. Hopkins in that position when Mr. Hopkins became Federal Emergency Relief Administrator.

William Merrifield Is Dead

WILLIAM MERRIFIELD, retired consulting engineer, who had been with the Consolidated Edison Company of New York, Inc., for thirty-eight years, died Sept. 20. He was 68 years of age.

A native of Ireland, Mr. Merrifield came to this country when a young man. He was active in Democratic politics on Staten Island where he made his home. He was a member of the American Gas Association from 1919 until his retirement in 1940.

REGRADING A GAS MAIN

By L. B. WILSON, JR.

Superintendent, Gas & Steam Distribution Dept.,
Consolidated Gas Electric Light & Power Co. of Baltimore

IN connection with the reconstruction of one of the principal approach roads to an internationally important war production plant, it was necessary to lower or raise the gas main supplying this plant and adjacent communities to conform to new grades at a number of locations.

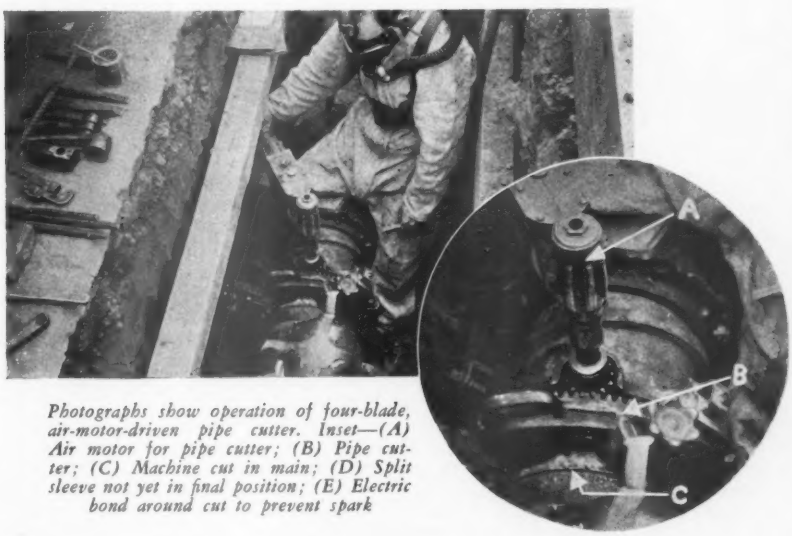
The main was 10″ cast iron, cement joints, carrying from 50 to 80 inches water column pressure at all times. The gas supply could not be interrupted.

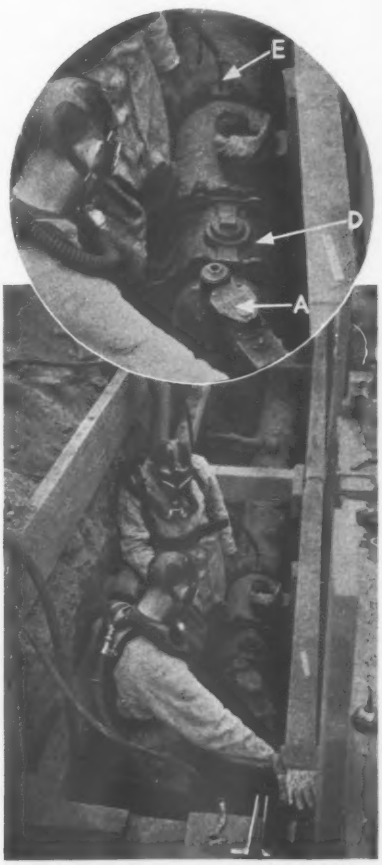
It was obvious that the ordinary method of capping out joints could not be employed; therefore, it was decided to cut the main at various points as required, install "rubber gasket" split sleeves to furnish the needed flexibility at points of maximum flexure and then lower by simultaneous operation of screw jacks.

The procedure was as follows:

1. Excavate down to new grade and support main on wood blocking.
2. Install screw jacks supported by steel beams across the ditch about every 30 feet.
3. Thoroughly clean pipe where "rubber gasket" split sleeve is to be installed through which main is to be cut.
4. Install electric conductor around the proposed "cut."
5. Start a wrapping of wide friction tape around the main close to line of the proposed "cut" and place flexible steel band loosely around the main. These are for use in emergency if main ruptures prematurely and it is necessary to make quick repair.
6. Place split sleeve around main on side of proposed "cut" opposite flexible band. Longitudinal gasket bolts made up, but end gaskets not made up.
7. Carefully block main top, bottom, and on both sides of proposed "cut."
8. Carefully place and center mechanical four-blade, air-motor-driven cutter and practically cut through pipe leaving inner ⅛″ of metal intact. After cutting to a depth of ½″, all but one blade of cutter was withdrawn to facilitate quick removal in case of premature rupture.
9. Remove cutter and wrap partial "cut" with wide friction tape.
10. Install split sleeve, with end gasket bolts not too tight.
11. Remove 3″ screw plug from body of split sleeve and complete "cut" by breaking remaining ⅛″ of metal with a cold chisel driven through tape wrapping into partial cut. Replace 3″ screw plug. Tighten end gasket bolts sufficiently to stop leaks.
12. Lower main carefully with screw jacks,

General view of excavation





Photographs show operation of four-blade, air-motor-driven pipe cutter. Inset—(A) Air motor for pipe cutter; (B) Pipe cutter; (C) Machine cut in main; (D) Split sleeve not yet in final position; (E) Electric bond around cut to prevent spark

taking out blocking as it is lowered in order to avoid breaking the main.

13. Tighten end gaskets on split sleeves, tamp earth tightly under main and backfill.

Sleeves were installed at each end of a section to be lowered (or raised) and at intervals of approximately 75 feet.

The men cutting the main were protected with asbestos suits and blower masks. CO_2 fire extinguishers were ready close to the operation with a man in charge.

The entire job required the regrading of 6,600 feet of 10" main at 17 locations. The maximum change in grade in any section was 31½". Five of the original cement joints were strained in relocating the pipe, resulting in slight leaks and requiring subsequent leak clamping.

New Gas Advertising Service Offered

A NEW syndicated advertising service for gas companies, consisting of 80 advertisements a year, complete in mat form, has been announced by Hixson-O'Donnell Advertising Inc., 19 West 50th Street, New York. A. W. Humm, who has had a long background of gas appliance merchandising experience, heads up the public utility division of the agency which is sponsoring the service.

With most newspaper mat services stopped by the war it has become increasingly difficult for many gas companies, particularly the smaller ones, to maintain regular advertising schedules in their local newspapers. The new syndicated advertising service produced by Mr. Humm should meet a special need at this time. On September 1 a description of the new service, together with ten advance proofs of ads, was mailed to a large number of gas companies. If you are interested and have not received a copy of this mailing, kindly address your inquiry direct to the above agency.

winning the war on the home front
VERBOTEN
If
THE AXIS COULD,
IT WOULD ABOLISH GAS OVEN COOKING IN ALL THE COUNTRIES OPPOSING IT. FOR GAS OVEN COOKING IS THE WORLD'S MOST ECONOMICAL METHOD—BOTH FOR FUEL AND FOOD!
PROPER DEGREE OF HEAT
IN GAS OVEN COOKING
YOU CAN COOK SEVERAL DISHES WITH THE SAME FUEL THAT YOU WOULD ORDINARILY USE FOR ONLY ONE DISH. PUT THESE SAVINGS INTO WAR BONDS AND STAMPS.
Thrifty Tip
FOR CLEANLINESS OCCASIONALLY WASH THE SIDES, BOTTOM, DOOR AND RACKS OF YOUR OVEN WITH SOAP AND WARM WATER AND WIPE DRY
YOUR GAS COMPANY

One in a series of striking new advertisements offered to gas companies

Runs Car with Natural Gas

NATURAL gas has been used with some success in the propulsion of an automobile owned by W. H. Thornton of the Northwestern Utilities, Ltd., Edmonton, Alberta.

Mr. Thornton carried approximately 50 cubic feet of gas in a rubber bag attached to the top of the car. With a Reynolds Regulator attached and with the carburetor adjusted to suit natural gas, the car ran about eight miles on the 50 feet of gas. "At this rate of consumption," the *Canadian Gas Journal* reports, "he is able to make 1000 cubic feet, equivalent to 1 gallon of gasoline, run his car for 160 miles."

Gas National Ad Copy Called Inspiring

COINCIDENT with the appearance in *Life* magazine, September 14, of the gas industry's first advertisement of the 1942-'43 series, Thomas F. Ward, advertising manager of *Life*, addressed the following letter to a large number of advertising executives:

"To use one of the favorite clichés of the day, 'They're cookin' with gas.'

"And to explain, I mean, in this instance, that the gas industry of America is doing a real job in working for victory.

"This thought is the theme of a stirring message from the gas industry to modern, patriotic citizens—a message designed to tell them how 'The Wonder Fuel for Cooking Now Speeds War Production.'

"Appearing in *Life* in the current issue, this eloquent story will be seen by millions of people . . . . for nearly 22,000,000 people read each issue—read it and are influenced by it.

"And, too, the ad is bound to carry particular weight, because *Life* readers are conditioned to such vital messages as this by *Life's* presentation in unique word and picture fashion of the news about everyday living, about the world at war, about the United States' production effort.

"The gas industry, I believe, is doing an inspiring and farsighted job in telling Americans this story—to help teach them the need for wise consumption of gas, and to help preserve the place of this great American industry in the life of our country."

C. C. Young Accepts WPB Appointment

CY C. YOUNG, who for the past eight years has been assistant to F. M. Rosenkrans, general salesmanager of The Gas Service Company, Kansas City, Mo., has accepted an appointment as senior engineer in the Power Branch of the War Production Board in Washington. He accepted the appointment for the duration of the emergency.

For a number of years Mr. Young has actively participated in the work of various committees of the American Gas Association and has made very fine contributions to the Association's work. He was a regional director of the CP program in 1942 and has been a leader in the national nutrition program.

Move To Avert Calif. Gas Shortage

A VITAL project to inject natural gas back into a depleted oil field for storage in order to avert a shortage facing Southern California this coming winter was announced Aug. 20 by the California Railroad Commission.

At the same time it was revealed that the Commission had asked the federal government to take over and operate as a storage reservoir the depleted, 240-acre Playa del Rey oil field near Venice.

Cause of the expected shortage, particularly in the Los Angeles and San Diego areas, is the tremendous additional load placed upon gas facilities by new war industries and the resultant increases in population.

According to Roy A. Wehe, the Commission's Gas and Electric Engineer, directly in charge of the gas survey, the shortage in Southern California may reach 16 million cubic feet per day during any unusual cold spells this winter.

Due to the shortage of critical materials, it has been impossible for gas utilities in Southern California to build new pipe lines and compressor plants to bring the necessary additional gas from field sources of supply.

If the Railroad Commission plan is adopted by the Government, two billion feet of surplus gas produced in the San Joaquin Valley, Ventura and Los Angeles Basin fields during the remaining warm months will be forced underground by high compression. This will permit the withdrawal of from 20 to 25 million cubic feet per day during cold spells this winter, or more than enough to meet the peak probable shortage of 16 million cubic feet. Next summer, it is planned to store three billion cubic feet, two of which would supplement the supply and the third to be used for pressure to force the stored gas out of the ground and into mains.

Personal AND OTHERWISE

Spaulding Joins Army Air Force

J. S. Spaulding

J. S. SPAULDING, advertising manager of Southern California Gas Co., Los Angeles, joined the U. S. Army Air Corps, August 31, as Captain. He is now attending the officers' training camp in Miami, Florida. Captain Spaulding served as a pilot in the air force with the AEF during World War I.

W. M. Jacobs, general superintendent of sales, Southern California Gas Co., Los Angeles, will represent California on the Committee on National Advertising and will also serve as a member of the Copy Committee, succeeding Captain Spaulding in both capacities.

New Technical Director of Gas Institute

Dr. Sullivan

DR. FREDERICK W. SULLIVAN, JR., has been appointed technical director of the Institute of Gas Technology, Chicago, effective Sept. 1. Dr. Sullivan went to the Gas Institute from the Barrett Division of Allied Chemical and Dye Corporation, where he has been manager of chemical research since 1940. Previously, he was director of research for Standard Oil Company of Indiana.

The new Gas Institute technologist received his Bachelor of Science, Master of Science and Doctor of Philosophy degrees in 1918, 1919 and 1921, respectively, from the University of Michigan. He served as instructor in organic chemistry at his alma mater from 1920 until the time he joined the staff of Standard Oil.

During the last year of the first World War, Dr. Sullivan served as a second lieutenant in the sanitary corps following training at the Rockefeller Institute.

Appointment of the new technical director marks the beginning of the second year of operation for the Gas Institute, which was founded Sept. 1, 1941. Like the Armour Research Foundation, it is located at and affiliated with Illinois Institute of Technology. Mr. Vagtborg is director of both the Gas Institute and Research Foundation.

As technical director Dr. Sullivan will have direct supervision of all research work at the Institute, both on specific projects for individual firms and general projects which the Institute carries on for the entire gas industry.

With the addition of a full-time technical director, Mr. Vagtborg announced that the Gas Institute is planning an expansion of its program both in research and educational work. Dr. L. E. Thiesmeyer, student counselor, directs the latter phase of work.

Male Chorus Celebrates Decade of Service

THE Male Chorus of the Rochester Gas and Electric Corp., Rochester, N. Y., which has conducted fine concerts for many organizations and is nationally recognized for its achievements, recently celebrated its tenth anniversary. The organization has to its credit a total of 260 concerts to a combined audience of 89,408 persons, not including radio broadcasts. It has sung to small organizations and large, ranging in size from groups smaller than its membership to an audience of 5,000 people, such as that which heard its magnificant performance at the annual Convention of the American Gas Association in Cleveland in 1937.

Its decade of helpful, harmonious effort has reaped a harvest of good will which is attested to by the scores of spontaneous messages which have flooded the company's offices. In the Rochester territory, the chorus has helped raise funds for many worthy purposes, singing for such organizations as: churches, high school classes, Boy and Girl scout troops, hospitals, American Legion Posts, Red Cross organizations, granges and many others. Some of its activities were outlined in an article in the September 1941 A. G. A. MONTHLY.

Organized in 1932 by Frank Houston, W. E. Hughes, Harry Taillie and Floyd Mason, it is now a talented, well-balanced singing group under the direction of Mr. Houston. It boasts many soloists and a wide variety of specialities, including inimitable songs and patter. Herman Russell, president of the company, is a strong supporter of the chorus program.

Eighteen of the original 30 members of the chorus are still in it. The chorus accepts many small country dates and the members' reward is measured in terms of appreciation and personal enjoyment. They have well been called "missionaries of song, builders of good will, and helpers of the humble."

It's a far cry from the ideals of the Axis powers and the chorus is carrying on, war or no war.

Joins WPB Power Branch

R. J. Plank

RICHARD J. PLANK, chief civil engineer and assistant superintendent of distribution for The Peoples Natural Gas Company, Pittsburgh, has been loaned for an indefinite period to the Power Branch of the War Production Board, E. M. Borger, president of Peoples, announced recently.

Mr. Plank has been in the employ of The Peoples Natural Gas Co. for the last 10 years. Before that he was with the Curtiss-Wright Flying Service and the United States Forest Service. He is assigned to the division of the Power Branch which has the responsibility of assuring a sufficient supply of gas to war industries.

A Fighting Family

Captain Baker and his son, Ensign Baker

A fighting father and son combination, pictured above, are making their full contribution to the cause of world freedom. Richard Royall Baker, Jr., and his son, Richard Royall, III, have entered Uncle Sam's fighting forces almost simultaneously. Mr. Baker, Jr., a first Lieutenant in the Army in the last war, resigned from the American Gas Association's Washington staff to become a Captain in the Army. His son, an honor graduate of the University of Virginia in 1942, has been commissioned an Ensign in the Naval Reserve and is now training in the Amphibious Service

DeBard Headlines Defense Show

Davis M. DeBard

APPROXIMATELY 12,000 people, including 8,000 Kansas City civilian defense trainees, heard Davis M. DeBard, vice-president, Stone & Webster Service Corp., New York, discuss civilian defense in England and the United States at an impressive show staged at the Municipal Auditorium, Kansas City, Mo., Sunday, August 23. The civilian defense trainees were graduated during the ceremonies at which Mr. DeBard was the principal speaker.

Mr. DeBard was introduced at the meeting by Major T. J. Strickler, vice-president of the Kansas City Gas Company. Following his talk which was broadcast over radio station WDAF, Mr. DeBard showed colored slides of British war posters and home defense activities.

Gallagher Promoted to Publicity Manager

JOSEPH A. GALLAGHER has been promoted to publicity manager of the Public Service Corporation of New Jersey, according to Walter F. Allen, director of publicity. Mr. Gallagher has been with Public Service since September 15, 1924. Previously, he was associated with the Plainfield *Courier-News*.

Thomas H. Spain, advertising manager of Public Service companies since 1937, continues in that capacity, Mr. Allen also announced.

With the relinquishing by Mr. Allen of the position of editor of the "Public Service News," company publication for employees, Mr. Gallagher also takes that post and S. Earle Clauss becomes associate editor.

Laboratories' Engineers Commissioned

TWO engineers of the A. G. A. Testing Laboratories, Pacific Coast Branch, have received commissions in the armed forces. O. N. Simmons received the rank of Lieutenant, Junior Grade, in the naval reserve and J. J. Kavanaugh a Second Lieutenant in the army.

Lieut. Simmons was associated with the Laboratories for six years, having been employed in May 1936. During this time he was engaged in all phases of testing and inspection activities and became well known to West Coast manufacturers.

John J. Kavanaugh, a former member of the Pacific Coast Branch, received his commission at Fort Sill, Oklahoma, in August. Inducted into the army in February, 1942, he was recommended for the Officers Training School in May. He is continuing to serve at Fort Sill.

The Cleveland Laboratories provided two men for the service during August. Albert J. Klika joined the staff in April, 1941, and resigned to enlist in the ground crew of the army air force. Herbert A. Taylor, a staff member since August, 1941, was inducted early in the month. Both were employed as draftsmen. This raises to twenty-four the names appearing on the honor roll.

Wins McCarter Medal

HOWARD LECKRONE, local manager of The Ohio Fuel Gas Company, Columbus, was recently awarded a McCarter Medal and Certificate for his outstanding achievement in saving life by the Schafer prone pressure method of resuscitation. Mr. Leckrone's act was commemorated and the award presented on August 28 at a meeting of officials, managers and supervisors of the company.

E. M. Tharp, vice-president and general manager, made the presentation and expressed the company's gratitude for Mr. Leckrone's fine work.

Sidney J. Ratcliffe Dies

S. J. Ratcliffe

SIDNEY J. RATCLIFFE, treasurer and a director of The Peoples Natural Gas Company, Pittsburgh, Pa., died Sept. 13, after a brief illness. He was 49 years old.

Mr. Ratcliffe was born in Buffalo, N. Y., Feb. 11, 1893. He was the son of the late George W. Ratcliffe, former president of The Manufacturers Light and Heat Company. He joined The Peoples Natural Gas Company in July, 1912 and was made treasurer and a director of the company in January, 1935.

Besides his wife, Dorothy Wolff Ratcliffe, he is survived by his mother, Mrs. Daisy E. Ratcliffe, Pittsburgh; one son, George W. Ratcliffe, Clarksburg, W. Va., and a brother, George L. Ratcliffe, Los Angeles.

Mr. Ratcliffe also was treasurer and a director of The New York State Natural Gas Corporation and The Keuka Construction Corporation and was a director of The Lycoming Producing Corporation and The Lycoming United Gas Company. He was a member of the Accounting Section of the American Gas Association and chairman of the Accounting Committee of the Pennsylvania Natural Gas Men's Association.

Wins Army-Navy E

John A. Robertshaw, president, Robertshaw Thermostat Co., Youngwood, Pa., speaking in the presence of distinguished Army, Navy and government officials during the ceremony Sept. 12 marking the presentation of the E flag for the plant's war achievement. The company received high praise from Under Secretary of War Patterson for converting its plant 95% to war production, erecting new buildings and even converting its sales force into war production craftsmen

Outstanding Gas Engineer Dies

A. C. Howard

A. C. HOWARD, a member of the Society of Gas Lighting and outstanding gas engineer, died August 31. He was 62 years of age.

A graduate of the United States Naval Academy, Mr. Howard served in the Spanish American War, receiving two medals, the Sampson Medal and the Spanish-American War Medal, for his distinguished services. He joined the gas industry in 1901 as cadet engineer for The United Gas Improvement Co., rising to assistant superintendent by 1911 when he was appointed gas engineer for the United Gas & Electric Engineering Corp. He was associated with the latter company as director, vice-president and consulting engineer until 1927. He was first vice-president of the Southern Gas & Electric Corp. and executive of a number of southern gas companies.

Mr. Howard had operating experience in at least 15 states and appraised utility properties in a score of others as well as Canada. He invented the "Howard Charger," used on many water gas sets. He was also instrumental in bringing natural gas to Monterrey, Mexico and Houston, Texas.

In the Fall of 1930, Mr. Howard returned to New York as engineer for the Eastern States Gas Company. He retired in the spring of 1933.

AFFILIATED ASSOCIATION *Activities*

Pacific Coast Annual Meeting

F. M. Banks

THE forty-ninth annual meeting of the Pacific Coast Gas Association was held at the Hotel St. Francis, San Francisco, on September 4. The program was confined to essential business and included only the receiving of reports of the president and Section chairmen and the election of new officers for the fiscal year starting Oct. 1.

F. M. Banks, vice-president, Southern California Gas Co., Los Angeles, was elected president for the new year. Other officers elected at the meeting are: Vice-president—E. L. Payne, vice-president and general manager, Payne Furnace and Supply Co., Beverly Hills, Calif.; Treasurer—D. H. Martin, general auditor, Pacific Gas and Electric Co., San Francisco. Newly elected P.C.G.A. directors are: R. G. Barnett, E. H. Coe, H. W. Edmund, A. H. Sutton, F. A. Woodworth, and R. S. Fuller.

New Section Officers

Section officers for the 1942-1943 term have been appointed as follows: Manufacturers'—A. H. Sutton, Mission Water Heater Co.; Accounting—P. W. Walters, Southern California Gas Co.; Sales and Advertising—R. J. Phillips, San Diego Gas and Electric Co.; Technical—F. F. Doyle, Pacific Gas and Electric Company. A. C. Joy, Pacific Gas and Electric Company heads the Cooperative Advertising Committee, and Gladys Warren, San Diego Gas and Electric Co., is chairman of the Women's Committee.

Retiring President R. S. Fuller, Pacific Gas and Electric Co., in his annual report spoke of the outstanding achievements of the Pacific Coast companies in aiding the war effort. He was followed on the program by Section chairmen who reviewed the Association's activities.

A gold medal was awarded to P. E. Beckman, J. J. Pugh and E. G. Arnedt, of the Pacific Gas and Electric Co., for their paper entitled, "Forecasting Winter Day Load in a Natural Gas Territory." First prize in the essay contest, "Public Utility Women in Defense" was won by Jackie Ludwig, San Joaquin Power Division, Pacific Gas and Electric Company. The latter division also was awarded first prize in the yearbook contest.

Acting under the assumption that general Section conferences may be impossible because of war conditions, the Association is planning a number of specialist meetings attended by one man from each company. Already a series of such meetings has been scheduled.

The Pacific Coast organization also voted to allow all members in good standing who enter the armed forces to continue as members with full privileges without further payment of dues until the close of the fiscal year next following their return to the industry or the cessation of hostilities, whichever comes first.

Gas Meters Association of Florida-Georgia

THE fall meeting of the Gas Meters Association of Florida-Georgia will take place October 9 in Orlando. War topics will predominate.

Mid-Southeastern Gas Association

THE annual meeting of the Mid-Southeastern Gas Association will be a one-day streamlined affair in Raleigh, N. C., on Friday, November 13.

A. E. Jones, chairman, E. J. Meade and L. A. Scott of the Program Committee are arranging for outstanding speakers to bring messages on pertinent topics.

There will be a dinner and meeting of the officers and directors on Thursday evening, November 12. The annual meeting will convene at 10 A.M., on Friday, November 13. The annual business meeting including the election of officers and directors for the coming year will take place at 4 P.M. At 7:30 P.M. will be the annual banquet.

New A.G.A.E.M. Officers

W. F. Rockwell

W. F. ROCKWELL, president, Pittsburgh-Equitable Meter Company, Pittsburgh, Pa., has been elected president of the Association of Gas Appliance and Equipment Manufacturers, effective at the beginning of the new fiscal year October 1, 1942. Other newly elected officers are: First vice-president—Lyle C. Harvey, president, The Bryant Heater Company, Cleveland; Second vice-president—D. P. O'Keefe, president, O'Keefe and Merritt Co., Los Angeles; Treasurer—John Van Norden, secretary and assistant treasurer, American Meter Co., New York.

CONVENTION CALENDAR

OCTOBER

Oct.	5-6	**American Gas Association Annual Meeting** La Salle Hotel, Chicago, Ill.
	12-14	**American Society of Mechanical Engineers** Rochester, N. Y.
	27-29	**National Safety Congress** Chicago, Ill.

NOVEMBER

Nov.	9-13	**American Petroleum Institute** Palmer House, Chicago, Ill.
	13	**Mid Southeastern Gas Association** Raleigh, North Carolina
	16-18	**American Institute of Chemical Engineers** Netherlands Plaza Hotel, Cincinnati, Ohio
	24-29	**National Chemical Exposition and National Industrial Chemical Conference** Sherman Hotel, Chicago, Ill.
	30-Dec. 1	**National Industrial Council** Waldorf Astoria Hotel, New York, N. Y.
	30-Dec. 4	**American Society of Mechanical Engineers, Annual Meeting** New York, N. Y.

Accounting SECTION

LYMAN L. DYER, *Chairman*
L. A. MAYO, *Vice-Chairman*
O. W. BREWER, *Secretary*

The War and Savings of Materials and Effort: A Task for Property Records

By R. L. McVEY

Public Service Company of Colorado, Denver, Colorado

THIS is War. These are trying times. Personnel problems confront everyone. There is an increasing demand for more detailed reports by regulatory bodies, defense boards and even by management. Materials are difficult to obtain and when obtained more complicated accounting for them is necessary. A practical solution must be found. Procedures must be streamlined. Unnecessary falderals must be abandoned. We must tighten up our belts and solve the problems.

The natural reaction of the property records accountant, who has a good system, is that the procedures and forms now in use are as simplified as he can make them and still furnish the necessary information. That is the error of our ways. Let us review our "hide-bound" procedures that have stood the test of time. The odds favor the discovery that certain work is duplicated, that several forms are being used that can be consolidated into one, and that red tape inter-twines our systems. As to furnishing the necessary information—what *is necessary?* How many reports have developed like Topsy and are continued after they have outlived their usefulness? Now is the time to eliminate those reports that we have always felt were unnecessary, but which we continued to make up because we had no logical reason to discontinue them.

Industrial Salvage Campaign

When the Public Service Company of Colorado inaugurated the Industrial Salvage Campaign, the property accountants were presented with some new problems. A committee representing the various departments of the company was appointed to survey the situation. At the time the committee was formed the several departments of the company were advised as follows:

"Comb out-of-the-way recesses of company plants and buildings; check up on materials in storage and bring them out to be put immediately into useful performance; eliminate waste of all materials; avoid duplication of reports and records; do everything possible to conserve material and labor as our contribution to the nation's war production effort.

"In connection with the campaign, nothing is too small or of too insignificant value to be passed up. Each department and operation of the company is requested to provide receptacles in which to accumulate any and all scrap materials. An engineer has been assigned to assist the committee in this work. Both he and the committee are available to be called upon in any way to further this campaign.

"New materials are difficult to obtain—in some cases impossible. Every bit of salvaged material we can use not only saves something that we would have to buy but perhaps takes the place of something we couldn't buy. We can provide the War Production Board with vital materials in three ways: first, by using something we have, even though it might not be exactly what we would like, and thereby saving for war production the material contained in a new article; second, by scrapping and disposing of all unusable materials promptly so they may become available for use in war production; and, third, by economizing in the use of all materials and supplies, thereby preventing waste."

Survey of All Materials

As the salvage program embraced a survey of all materials, the property accountants became keenly interested since here was an opportuity to eliminate a "bugaboo"—not stock items. The suggestion of the property accountants to reflect the cost of all material in stock, so that the WPB reports could be prepared with less confusion and so that the work orders would reflect the cost of all material used, was adopted by the committee. The engineer who made the detailed study of materials summarized the material to be reviewed by the salvage committee in the following groups:

1. Items in stock that should be transferred to a location where there will be a demand for their use.
2. Items in stock that should be sold as second hand or junk.
3. Items not in stock that would be used and which should be placed in stock at current prices.
4. Items not in stock that might be reused for repair parts—the scrap pile stock—which should be placed in stock at junk prices.
5. Items not in stock that should be sold as junk.

Thus, one of the headaches of the property accountants was solved while at the same time a considerable quantity of scrap material was collected and sold.

There is, however, a problem which arises from the salvage campaign—that of making attractive the use of second hand equipment such as motors, pumps, boosters, compressors, oil circuit breakers, voltage regulators, etc. The Uniform System of Accounts instructs as follows:

"Material recovered in connection with construction, maintenance, or the retirement of property shall be charged to this account (131-1 Materials and Supplies—Utility) as follows:

> Reuseable materials consisting of large individual items shall be included in this account at original cost, estimated if not known. . . . ."

Construction men are quite willing to follow this instruction since the authorization for expenditure for the removal of equipment will reflect the credit by way of salvage for the original cost of the items of equipment. There has always been a hesitancy, however, to install large identifiable items of used equipment on new construction since the work orders reflect the original cost of the used equipment when, in many instances, new equipment might be purchased at a cost not to exceed the stock price of the used equipment. In many instances more efficient equipment could be purchased at a cost lower than the stock value (original cost).

Of course, it can be explained to them that, offsetting the original cost of this item, there reposes in the appropriate Reserve for Depreciation or Amortization account an amount theoretically equal to the expired service life of the equipment. This still does not answer their problem since the final report of expenditures made against the appropriation on which the used equipment is installed will reflect the original cost of the equipment thereby resulting in a higher total reported expenditure than that which they believe to be correct if the used equipment had been charged to the work order at "true or actual" value.

When this equipment is salvaged at original cost, the amount of reserve accruals applicable thereto remains in the appropriate reserve account. Plant Instruction 14 in the Uniform System of Accounts instructs as follows:

"When property consisting of one or more retirement units is transferred from

one account for gas plant to another or to Account 110, Other Physical Property, from one utility department to another, such as from gas to electric, from one operating division or area to another, to or from Account 100.1, Gas Plant in Service, Account 100.2, Gas Plant Leased to Others, and Account 100.4, Gas Plant Held for Future Use, the transfer shall be recorded by transferring the book cost thereof from the one account, department, or location to the other, *and likewise any related amounts carried in* Account 100.5, Gas Plant Acquisition Adjustments, *in the depreciation reserve,* and other accounts *shall be transferred in accordance with the segregation of such reserves* and other accounts." (Emphasis added.)

original cost and useful value. This entry will be posted in the other items section of both the depreciation reserve account and the account affected by the retirement. When the work order is cleared, the amount of this entry will be recorded as a charge to retirement work in progress and credited to the other items section of the depreciation reserve account for the department reinstalling the equipment. In effect, this is a wash entry through retirement work in progress which reduces the reported expenditure for the construction project in the same manner as a salvage entry.

Example:

REPLACE 35 HP MOTOR WITH 50 HP MOTOR AT GAS PLANT—1940
FINAL EXPENDITURE REPORT

Construction Work Order		
Purchase and Install 50 HP Motor		$750.00
Retirement Work Order		
Cost of Removal		25.00
Salvage (35 HP Motor at Original Cost)		R 400.00
Total Net Expenditure		375.00

(The book cost of property retired has not been included in the expenditure total since all companies do not follow the same practice with respect to this item.)

INSTALL USED 35 HP MOTOR AT COMPRESSOR STATION—1942
FINAL EXPENDITURE REPORT

Construction Work Order		
Install used 35 HP Motor Salvaged in 1940 at original cost $400.00 and other costs		$475.00
Retirement Work Order		
Depreciation Reserve Transfer		
Original Cost	$400.00	
Useful Value	250.00	R 150.00
Total Net Expenditure		$325.00

Please note that the total net expenditure when the 35 HP Motor was reinstalled is $325.00 under this procedure as contrasted to $475.00 if the depreciation entry had not been set up.

If this instruction may be interpreted also to mean that if this type of used equipment is withdrawn from stock for installation in another account, by another department, or at a different location from that on which retired originally, then the related amounts in the reserve accounts should also be transferred. If this be true, then in order to eliminate the possibility of omitting the transfer of related amounts in the reserve accounts and to reflect only the useful (salvage) value, measured in terms of expected remaining life and of capacity needed, in the construction expenditure report when the equipment is reinstalled, the following procedure is suggested for consideration:

The large identiable items of equipment will be salvaged and stocked at original cost when retired from service. Upon reinstallation, the items will be withdrawn from stock and charged to construction at original cost. When the work order is analyzed prior to clearance from construction work in progress to utility plant in service, a journal entry will be set up charging the depreciation reserve account for the department from which the item was originally retired and crediting the retirement work order for the difference between the

Following are some of the benefits which would accrue through the adoption of this procedure:

1. This procedure will reflect original cost as salvage in the work order on which the item is retired thus reducing the reported expenditure and encouraging the construction department to salvage items which may be reused, rather than to report them as "junked."
2. The items will be carried in materials and supplies stock at original cost as required by the system of accounts.
3. The items will be recorded in utility plant in service at original cost if reinstalled.
4. This procedure will tend to eliminate the possibility of failure to set up the transfer of depreciation reserve from one department to another as required if the item is reinstalled in a department other than that from which salvaged.
5. This procedure will reduce the reported expenditure for the project on which the item is reinstalled by the difference between original cost and useful value, thus encouraging the use of items of this nature as the construction department is, in effect, charged only with the useful value.
6. The amount of depreciation reserve applicable thereto is not determined until the used item is reinstalled and then the amount is based upon useful value.

It will be necessary to use caution in the determination of the useful value of the items at the time of reinstallation. The useful value should be established by the department which is reinstalling the item. Therefore, when items are reinstalled and charged to work orders by withdrawal from special and inactive material and equipment stock, the department withdrawing them should write a memorandum to the Property Records Section covering the following:

1. Description of item.
2. Original cost and date of original purchase (from Stores records).
3. Work order on which reinstalled.
4. Stock material withdrawal requisition number on which withdrawn.
5. Estimated useful value.
6. Basis of estimating useful value.

The specific savings of material gained through the foregoing procedure leads one to a consideration of what savings of effort may be revealed through a general review of certain Continuing Property Records practices. It is true that the problem of simplification of records and procedures must be dealt with by individual companies. None the less, it may well be that some of the following methods which are now in effective use by certain utilities may be adopted or adapted to the circumstances of other utilities (or your company) and result in savings of effort and cost.

Clearing Account for Exempt Materials

One economy in property accounting may accrue from a simplification of checking materials and supplies reported charged to work orders against field completion reports. Several companies have provided a clearing account for exempt materials which may be used for the purpose of spreading the cost of small items of material. Too much time is likely to be spent in proportion to the dollar value involved if an analysis is made of other than coordination items.

One method which may be used to check input and output of the coordination items is to summarize these items from the following three sources:

1. Completion reports furnished from the field.
2. Net withdrawals from stock, as reflected by withdrawal tickets.
3. Sketches or blue prints of the finished job.

A further simplification may result from the use of the "standard cost" method of distributing construction costs to units of property. There are advocates of the theory that the total installed cost including overheads may be distributed on a unit cost basis. Whether this method is used, or material and labor is distributed on a standard cost basis and other costs spread on the basis of either labor or material or a combination of both, the result is practically the same.

If material is distributed separately on a

standard cost basis, there is provided a means of checking dollar-wise the items of material, as reported from the field, against the charges to the work order. In this practice no analysis of stock withdrawal tickets is necessary unless the standard cost of material varies beyond pre-established limits of tolerance from the charges for material as shown on the work order.

In addition to giving consideration to the methods to be used to check materials and to distribute costs to units, also some thought should be given to simplifying the property units. The simplification of outside plant or mass property units may be effected by the elimination of types and make. Several items may also be combined to form an average unit. For example, the pole top assembly may be carried as an average unit rather than maintaining a record for each sub-assembly namely, crossarm, guy, bracket, rack, etc. Of course there will be widespread differences between the pole top assemblies of individual poles, but when a total year's transactions are considered in the aggregate the same answer will be approximated if average pole top assemblies are used rather than following the more detailed method of accounting for charges by individual subassemblies. The adoption of more simplified record units will effect a marked decrease in the amount of detail necessary to maintain the continuing property records.

Streamlining Plant Accounting

The elimination of the detailed property ledger in the instance of inside plant would certainly be a step toward streamlining plant accounting. The procedure customarily used is to distribute the costs as recorded in the work order to units of property on a cost analysis work sheet. This information is then posted to continuing property ledgers from the cost analysis sheets. This additional ledger and attendant posting may be eliminated by providing space on the cost analysis work sheet in which to record the date and reference to the work order through which the property is retired. The cost analysis work sheet may be designed with the columns used to distribute the components of cost on the left portion of the sheet. The right portion of the sheet may be designed with columns headed as follows: Property Installed, Quantity Installed, Total Cost Installed, Date and Work Order—Retired. When a work order is closed a separate cost analysis sheet should be used for each plant account and each location and these sheets filed by plant accounts and locations. The total plant account sheet for each location will serve as the control for the open items remaining on cost analysis sheets for each plant account and location. This procedure will eliminate a vast amount of posting and a repetition of description of the units of property on both the cost analysis sheets and the continuing property ledgers.

Each individual property records accountant is aware of his own problems. The suggestions made here may not apply to your case, but a modification of such procedures may well be adopted. The procedure outlined above is not intended to cure all the ills, but it is an attempt to show how certain problems may be met and the possibilities of further simplification of plant accounting with resultant economies.

Priorities Eased on Defense Projects

INSTALLATION of utility facilities using critical materials in defense-rated projects will be expedited under terms of an amendment to P-46 announced Sept. 14 by the War Production Board. Order P-46 covers maintenance, repair and supplies for utilities.

The amendment provides that suppliers of utility services to projects rated A-5 or better which require iron, steel or copper for their construction will be granted the highest rating assigned to other equipment for the project which also uses iron, steel or copper.

All other required utility facilities will be assigned the lowest rating granted to materials for the project, so long as the rating is not below A-5.

Utility Program Reduces Mileage 35%

CONSOLIDATION of many services that occasioned the extensive use of the large fleet of automobiles and trucks of Public Service Electric and Gas Company in New Jersey will bring about a reduction of approximately 5,500,000 miles per year (or 35 per cent), in the use of these vehicles, the company announces. This estimate is based upon figures compiled since the company instituted its gasoline and tire conservation plans some months ago in cooperation with the government.

With the institution of strict rubber and gasoline rationing, Public Service officials, in all branches of the company, immediately revamped plans and schedules for the operation of motor vehicles.

Public means of transportation have supplanted the use of company cars by meter readers, testers, repairmen and inspectors where practicable. In some of the outlying districts, four or five men are transported to a central point by automobile where their work is laid out so that, at the conclusion, they are within close proximity of buses and trolley cars.

If Gas Appliances Wore Rubber Tires

"Perish the thought!" you reply, but ANY equipment will last longer if you give it that same loving care you give your tires!

Customers' requests for disconnections, reconnections and wiring inspections are being grouped and, instead of being handled upon receipt of the call, they are answered as soon as several calls are received from the same area.

The freezing by the government of the sale of various appliances, including refrigerators and gas ranges, has curtailed the number of calls for "connects" and "disconnects," thereby automatically effecting a considerable saving in mileage.

Checking of meters and some connection work by the gas department is taken care of, in congested areas, by men who travel on bicycles. Restrictions in the use of critical war materials have resulted in the curtailment of plans for underground and other construction work in the electric and gas departments for the duration.

Gas Plant Protection Plan in Colorado

COMPLETE plans for defense against any enemy bombing attacks have been arranged by the gas service departments of the Colorado Public Service Co., Denver, Colo.

The entire pipe line distribution system, consisting of low pressure lines augmented by 13 pressure-regulator feeder stations, has been divided into zones comprising industrial and residential areas. Each zone will be controlled by its own pressure regulating station, which can turn off gas delivered into that area. Each station is equipped with plugging equipment for breaks, firefighting apparatus and repair items.

Holders, main station and other gas properties have been rewired for central manual switch control of electric lighting, which can be switched off in an instant. The main building is a part of the established air raid warden system, and has also been provided with remote control switches for extinguishing interior lighting and the 7000-bulb facade which is one of the highest spots in the mountain city.

Did You Notice?

Did you notice that ancient vintage gas range in the recent national magazine (*Saturday Evening Post,* Sept. 5) salvage campaign of the United States steel companies? The ad said the old range was "equal to ten 4-inch shells!" In death as in life the old gas range still serves its country. . . . But we warn the junk gatherers, many of those old ranges are still doing yeoman service. They just won't wear out.

Blimp Origin

Experimenting with lighter-than-air craft of the non-rigid type during the first World War, the British found that Model "A-limp" did not stand up in battle. . . . But "B-limp" did, and thus became the "Blimp."—*Ernst Behrendt* in *"The Reader's Digest."*

Finish Drying by Infra-Red Method

By PAUL H. GALLAGHER

Engineer, Infra-Red Equipment Corporation, Chicago, Illinois

RECENTLY, the Infra-Red Equipment Corp., 1217 W. Washington Blvd., Chicago, Ill., developed a new type of gas-heated oven employing radiant type gas burners which utilize the advantages of both infra-red ray and convection heat baking methods. The equipment has been adapted to converting old ovens. Many old ovens thus equipped provide maximum efficiency in minimum baking time. Infra-red burners have proved very efficient and economical in operation and reduce the cost of baking considerably.

Let us examine the features of this newly developed equipment to see how the cost of operation, for example, has been reduced. First, the gas and air are premixed in the proper proportions for perfect combustion before delivery to the burner and this mixture is then forced directly onto the refractory surfaces which are brought up to incandescent temperature and emit infra-red rays. The premixing of the gas and air before entering the burner eliminates the necessity of entraining secondary air and thus the gas is completely burned leaving no obnoxious fumes in the products of combustion.

No Heat Transmission Loss

The second item to consider is the effect of the infra-red rays on the articles being baked. These rays form a considerable part of the total heat and there is actually no loss in transmission of them. Infra-red rays can be transmitted from the source to the article to be dried with perfect efficiency, there being no effect of intervening temperature conditions on them. The full force of the infra-red rays is effective for heating the articles and there is no loss through the stack.

With speed in production now being demanded in all lines, the reduction in time required for baking with this modern method aids in increasing the flow of goods along the production lines. The infra-red generators have a wide range of turn-down, permitting a great amount of heat at the start for bringing the oven up to the required temperature in the shortest possible time. After the baking temperature is attained, the generators can be turned down for holding the temperature at that point and this can be done automatically. As an example of this, an oven can be heated to 300 deg. F. in about seven minutes, and to 400 deg. F. in about 11 minutes, from a cold start. The advantage of this is obvious in batch type ovens where the recovery time between batches is a considerable portion of the baking cycle.

Urea formaldehyde enamels can be baked with the infra-red method in 4 to 9 minutes. Oil base paints which formerly required an hour to bake can be done in 16 minutes; and japan, one of the slowest baking finishes which in innumerable cases formerly required one and one-half hours and longer to bake, can now be baked in 20 to 25 minutes.

The infra-red method can be used with any kind of finish and it need not be limited to special fast baking finishes. This is particularly essential in recent days, since fast baking finishes are not always obtainable and former oil base, slow baking types must be substituted.

The following data on various gauges of metal were compiled after tests run with the infra-red method of heating: No. 20 and 16 gauge metals were placed in an oven with the air temperature at 250 deg. F. The 20 gauge metal rose to 250 deg. F. in three minutes and then leveled off at a temperature of 270 deg. F. in four minutes. The 16 gauge metal reached 250 deg. F. in three and one-half minutes and 270 deg. F. in five minutes.

Other thicknesses of metal showed a correspondingly similar heat-up time. It is very significant that the metal temperature reached a higher point than the air temperature of the oven. This shows directly the effect of the infra-red rays.

These two gauges of metal were then placed in the oven with an air temperature of 350 deg. F. The 20 gauge metal reached 350 deg. F. in five minutes and the 16 gauge metal reached this temperature in six minutes, or about a minute longer than required in a 250 deg. F. oven.

This type of oven heating is readily adapted to baking all kinds of work regardless of size, shape, or thickness of the metal and its effectiveness is therefore not limited to uniform articles. Included in this infra-red method is a complete recirculation system which draws the air from the top of the oven and delivers it to the bottom where it flows over the generators and being again heated maintains an even heat in all parts to within plus or minus five deg. F. This even temperature permits utilizing the greatest capacity of the oven, since the articles can be placed throughout the height of the oven and this evenness also assures uniformity of finish on all parts of the articles. A sufficient amount of the recirculated air is exhausted, thus maintaining clear atmosphere which results in paint of higher luster.

Reprinted from August, 1942, issue of *Products Finishing*.

War Work

There are more than 80 industrial firms in Indianapolis alone using gas, whose production is almost entirely devoted to the manufacturer of materials vital to the war effort. Such items, for instance, as serums, bar steel, castings, foods, high speed tools, and so forth.

Clow Founder Dies

WILLIAM ELLSWORTH CLOW of Lake Forest, Ill., founder and chairman of the board of James B. Clow and Sons, manufacturers of gas heating equipment, died Sept. 14 at the age of 82. The firm was founded by Mr. Clow in 1878 as a plumbing and water works supplies concern shortly after he went to Chicago from Pittsburgh, his birthplace.

He leaves a widow, Margaret; two sons, William, Jr., and Kent S., and a daughter, Mrs. Donald B. Douglas.

New oven equipped for gas infra-red method of paint drying

GAS AT WORK ON THE WAR PRODUCTION FRONT

Lunch boxes are mighty few around some war production plants, comments an observer. The gas-cooked hot food in the plant cafeterias is too good.

◆

Enameling furnaces are being converted to direct-fired war work by removing muffles. Some believe this will open a big market for gas radiant tubes when reconversion takes place.

◆

United Gas Pipe Line Company's big business magazine advertising of the Gulf South continues with a punch. The area's all-out war effort is forcibly brought out, and so are the coming peacetime industrial opportunities.

◆

Exact heat treating is the key to the success of the new National Emergency lean-alloy steels. Reports indicate that heat treatment in modern gas furnaces has met all expectations. Another instance of heat and metals, a backbone of the war effort.

◆

Public health during wartime is important. To help maintain it the hot water twins of the Volume Water Heating Committee, urge you to help your public health officers enforce the laws on clean sanitized glasses. How many beer glasses are washed in *hot* water in your city? How many at your favorite bar?

◆

Despite public opinion to the contrary, high-grade alloy steels are being produced in open hearth furnaces.

◆

Bad news for the Axis—The American Torpedo Corp., St. Louis, torpedo manufacturers, who took over a half-completed building designed as a tin can factory, is now using gas for many processes in the manufacturing of aerial, submarine and destroyer torpedos.

◆

Clean-up? Yes, it's due to the fast overturn of dishwashers, but health authorities in many cities and states are now cracking down and putting heavy pressure on restaurants which have not been as clean as they might be in the sterilization of their glassware, china and utensils—*and it's about time!*

◆

War workers at the United States Armory in Springfield, Mass. are getting 2,500 or more meals daily at a new modern cafeteria, 24 hours a day. All gas-bakery.

◆

The world's largest Naval Training Station at Great Lakes, Ill., is training cooks in the Service Schools—the Navy's trade school. During a 16 weeks' course prescribed by the Navy they receive instruction in meat cutting, range work—roasting, frying, etc. on gas ranges, steam pressure cooking, and steam kettles.

◆

Gas air draw furnaces seem to be the standard for tempering shell.

Commercial Cooking Group Organized by WPB

THE War Production Board has organized the Plumbing and Heating Commercial Cooking Equipment Industry Advisory Committee. This committee is working with the Plumbing and Heating Branch of WPB under the direction of W. W. Timmis, Chief of the branch, and other members of the branch including H. L. Holbrook, J. Noble, L. Eaton and others.

The function of this long-named committee is to advise in connection with the new WPB order on commercial cooking, baking and warming equipment other than that heated with electricity. The new order is expected to simplify procedure in manufacturing and distributing food service equipment and at the same time still further save critical metals.

The committee is composed of the following equipment manufacturers:

Albert Pick Co. Inc.
S. Blickman, Inc.
American Stove Co.
Detroit-Michigan Stove Co.
Groen Mfg. Co.
Cleveland Range Co.
The G. S. Blodgett Co. Inc.
Standard Gas Equipment Corp.
Majestic Mfg. Co.
Dohrmann Commercial Co.

W. H. Frick, E. J. Shermire and W. Frank Roberts are members of the A. G. A. Food Service Equipment Committee; these gentlemen represent American Stove Co., Detroit-Michigan Stove Co., and Standard Gas Equipment Corp., respectively.

Ingenious Substitutes

A LARGE metropolitan utility recently listed some of the changes now in effect because of vital material shortages. For instance, aluminum paint is no longer applied to gas meters. In its place a neutral colored, quick-drying paint is used. Number tags for gas meters, formerly made of brass, are now being formed out of tin cans salvaged for the purpose. Shellac, used to bind sheepskin diaphragms to frames, is also getting scarce. So now the meter repair shop is cutting the shellac with alcohol to make it go farther.

After the present stock is gone, aluminum will not be utilized for meter pans, sign plates and moldings in auto body work. The only substitute is plastics. The latter are also being considered for gas refrigerator tubing now made of copper.

INDUSTRIAL AND COMMERCIAL GAS ADVERTISING FOR OCTOBER

The National Advertising Committee of the Industrial and Commercial Gas Section, J. P. Leinroth, chairman, and F. B. Jones, vice-chairman, announces that full-page advertisements will appear in the trade and business magazines listed below during the month of October. These advertisements are prepared in cooperation with the Committee on National Advertising as a part of the industry's national advertising campaign.

MAGAZINE	THEME
General Manufacturing	
BUSINESS WEEK (Oct. 10—⅔ page)	He doesn't wear any chevrons . . . but the *GAS Engineer* plays a vital role in war production.
Metals Industry	
THE IRON AGE (Oct. 22) *INDUSTRIAL HEATING *METAL AND ALLOYS (*Metal Show Issues)	Where *precision manufacture* is vital . . . the call is for the precision fuel—*GAS*.
Ceramic Field	
GLASS INDUSTRY	A glass life raft? . . . That's only one of the many new products in Ceramics . . . and *GAS* is helping in the swing!
Hotel and Restaurant Field	
HOTEL MANAGEMENT	The world's biggest "restaurant chain". . . uses *GAS*.
Hospital Field	
MODERN HOSPITAL	Part of your Hospital is in the Army and Navy—BUT . . . your Hospital has to keep running, caring for and feeding patients . . . and that means your present *GAS* cooking equipment must be kept operating efficiently.

Technical SECTION

HAROLD L. GAIDRY, *Chairman*
J. H. WOLFE, *Vice-Chairman*
A. GORDON KING, *Secretary*

Saving Gas Oil by Mixing High B.t.u. Coke Oven Gas and Blue Gas

R. E. Kruger

Mr. Kruger's paper which is published herewith has been judged the best technical paper presented at American Gas Association meetings during the past year. For making this outstanding contribution to the gas industry, Mr. Kruger will receive the Beal Medal at the Annual Meeting in Chicago this month. He joins a select list of distinguished winners. An article on his achievements and the presentation of the award will appear in the next issue of the A. G. A. MONTHLY.

By R. E. KRUGER

Supt., Gas Mfg. Dept., Rochester Gas & Electric Corp., Rochester, N. Y.

DURING the past 15 years the gas load at Rochester has been carried by furnishing to all customers a mixture of coke oven gas and producer gas having a B.t.u. of 538 to 540. Enough plant capacity was available so that a very large part of the entire yearly load could be taken care of in this way. In later years when the load could not be met in the above manner, we mixed in carburetted water gas of about 550 B.t.u. to meet increased loads brought about by extremes in winter temperatures or by emergencies of one type or another. This seemed to us to be the logical way to carry our loads.

Our coke oven gas has an average B.t.u. value of 636, and the producer gas mixed with it has a B.t.u. value of 140. These were mixed in such proportion that the mixture had a B.t.u. value of 550. After the mixture was put through the light oil scrubbers, it had a B.t.u. value of 538-540.

Coke Oven Operation

By so generally carrying our total send-out with this coke oven gas mixture, we, of course, made a corresponding tonnage of coke which in Rochester has always been very largely sold on the local domestic market. As all oven operators know the success of coke oven operation depends very largely upon the coke market, and those of us who operate coke ovens in the utility field fully realize the advantages of meeting the gas load in a given community with oven gas and by so doing have the privilege of dispensing all of the resultant coke to that same community at a fair price.

Such a setup in many ways is ideal, but as might be expected we were not always able to move completely all the coke we made, and not believing there was much to be gained by large stock piles, we controlled our stocks by making less coke, this meant making less coke oven gas than was necessary to meet our gas loads so that we had to make water gas to make up the difference. This, of course, used up coke so that we had a two-way method of controlling coke stock.

Compared with straight coke oven operation, however, it was rather expensive, chiefly because gas oil had to be used. As time went on and our gas loads became greater, particularly during the winter season, more and more water gas had to be made entailing, of course, the purchase of greater quantities of gas oil. Strangely enough there were times when even the larger amounts of water gas made did not require enough coke to keep our coke stock as closely in hand as desired.

Along with the extra cost of water gas and the increasing amounts necessary, we began to notice an increase in complaints from our customers on our gas distribution system. These periods of increased complaints seem to coincide with the periods of fairly heavy water gas additions to our normal coke oven—producer gas mixture. A large share of the complaints came about through pilot outages, flashbacks, and noisy extinction.

After establishing a relationship between this increase in complaints and the addition of water gas, we naturally attempted to correct the situation. First, we knew of certain published data indicating that as we added greater quantities of water gas, we must correspondingly increase the B.t.u. value of the water gas in order to escape an increase in service complaints. We tried this and it seemed to work. Unfortunately, however, this entailed the use of greater quantities of gas oil and lesser quantities of coke to make a thousand cu.ft. of gas. Both of these were in the wrong direction for us.

There had been some indication that our service men were setting our flames too hard so that when the water gas was added they became harder, and many of them went out or flashed back. Obviously, it seemed reasonable to actually determine whether our service men were making adjustments on the hard side. This piece of investigation was undertaken by our laboratory staff cooperating with our distribution department, and it was found to be true that flames were quite generally set on the hard side. I do not want in any way to infer that our service men did this maliciously. They merely did the job that way because they honestly believed it was the best way to do it, and they believed it because they had done it that way for years.

Service Complaints Lessened

The transition from the old type burners to those of more recent vintage had some bearing too on this matter. Anyway by studying the rates of gas input to a burner and by studying the more important phenomena of air-gas ratios in burner head (both old and newer types), we were able to instruct our service men in a way that got us away from so many service complaints. This work was very much worth while, a lot was learned, and curiously enough the service men were not the only ones who learned it. Our laboratory staff learned a lot as did also the supervisory staff of both the gas distribution and gas manufacturing departments. And it is nice that it was so. What was learned is going to be of daily use in many ways as long as we remain in the gas business. This work was fully presented by Mr. Yeaw at the Distribution Conference in Pittsburgh in 1941.

However, this did not solve our problem for we still had to make water gas and at times of a B.t.u. value higher than 550, so the work can only be considered to be a step in the right direction. Along about this time our Mr. Beebee gave our laboratory staff the job of studying the characteristics of gas mixtures. A lot of work was done on this covering principally a wide variety of mixtures of such gases as

TABLE I

The following tabulation will show the quantities of materials used in each case when making 17,309 M of sendout gas of 545 B.t.u.:

	Oven Gas	*Prod. Gas*	*Prod. Gas Fuel*	*Water Gas*	*Water Gas Fuel*	*Blue Gas*	*Blue Gas Fuel*	*Gas Oil*	*Total Coke*
Prod. Gas Mixing	12,621	2,859 M	20.4	1.829 M	27.5 T	....	....	5670	47.9 T
Blue Gas Mixing	12,621	....	....	....	....	4,688 M	93.7 T	....	93.7 T
								Diff. =	45.8 T

we made or could make or otherwise had available.

From this we all learned a lot about the burning characteristics of these various mixtures. Among many other things a small amount of work seemed to indicate that a mixture of our coke oven gas and blue gas behaved just as well or better than did a mixture of coke oven gas and producer gas. This seemed rather hard to believe, especially in view of the fact that we had an increase in service complaints when we added water gas to our regular gas beyond a certain percentage, and also because beyond that percentage we had even to increase the B.t.u. of the water gas added.

This wasn't the first time that things seemed at odds with each other, and from certain chemical data and certain combustion characteristics of our oven gas and of blue gas, I could not see why it should not give a better mixture than did coke oven gas and producer gas. If it were true that it were better to mix coke oven gas and blue gas than to mix coke oven gas and producer gas, an interesting set of possibilities appeared on the scene—for example, we could materially increase the output of 550 B.t.u. gas from our ovens, for obviously more blue gas of 300 B.t.u. can be added to a 636 B.t.u. coke oven gas than can producer gas at 140 B.t.u., and likewise less of the 550 B.t.u. water gas need be made. Also, it would take more coke to make blue gas than to make 550 B.t.u. water gas. This would help control our coke stock.

Operating Problem Simple

So here was an opportunity to achieve both our objectives by one stroke. From a common sense point of view it amounted to this: Excess coke in stock is nothing more than so many B.t.u.'s; gas oil bought from an oil company likewise is nothing more than so many B.t.u.'s, so why should I buy B.t.u.'s from an oil company when I've already got a yard full of them in a form that I can use. This seemed very much worth while developing—first, from a purely mathematical point of view, and even rough basic considerations along this line indicated that a lot could be accomplished. From an operating point of view in our case there was nothing to worry about for we had the water gas machine equipment already installed and all set to operate. The matter of mixing was no problem at all; we could put the blue gas into the same place we formerly put producer gas for mixing or we could just as well introduce it into the coke oven system in other places.

From an operating point of view there was then not much to the problem. Experience over some years of operation indicates that when we operated our coke ovens at capacity, we produced 12,621 M of 636 B.t.u. oven gas, and when we mixed this with 140 B.t.u. producer gas, we produced 15,480 M of a mixture of oven gas and producer gas having a B.t.u. of 545. In this case the oven gas represented 81.3% of the mixture and producer gas 18.7%.

Now, if we use blue gas for mixing, the same 12,621 M of 636 B.t.u. oven gas gives a mixture of 17,309 M having a B.t.u. of 545. Here the oven gas represents 72.8% of the mixture and blue gas 27.2%. It is obvious that we have increased our coke oven gas capacity from 15,480 M/day to 17,309 M/day without carbonizing additional coal. And, obviously, we could meet 17,309 M sendouts without making any carburetted water gas whereas before we could only meet a sendout of 15,480 M without making water gas.

Coke Replaces Fuel Oil

It is at once obvious that in this setup we made 45.8 tons of coke do the job formally done by 5670 gal. of gas oil, and since this was excess coke, we considered it good business. Whether it be good business at any time depends largely upon the price relationship between coke and gas oil or more broadly between generator fuel and enriching oil. This, of course, anyone can quickly determine in any given instance. That in brief is all there is to this from an operating point of view. If this oven gas-blue gas mixture could be used successfully by our gas distribution system, we should go ahead with our mixing in that manner.

Inasmuch as so much depended upon getting a correct answer to this, we disregarded laboratory setups and got our answer by technically observing actual customer appliances operating on various mixtures of oven gas and blue gas and later operating on several other mixtures. All of our test work was set up in a way that made it unnecessary for us to make the usual "jump" from laboratory data to operating practice. It was done in this way:

We had available in the plant a 1,000 M cu.ft. holder that we did not need for operating purposes. We set this aside and put into it from 600 M to 900 M of any gas mixture we wanted to study, and the gases comprising these mixtures were made in exactly the same manner as when we were on full plant operation at any time. The various gases under consideration were pumped into the holder with works equipment, care being taken that the various percentages were correct; the mixture was allowed to stand for 24 hours or more to insure thorough mixing, and then pertinent physical and chemical characteristics were determined and recorded. This procedure gave us all the gas we wanted for testing any appliance we had and for rechecking any and all the data we cared to check. One can readily see the advantage over "messing around" with small laboratory bottles or even small holders. When all work had been satisfactorily completed on one mixture, another was put into the same holder and the work went on.

Fortunately, there is a room near this holder about 30 ft. x 60 ft. In this we installed the following pieces of household equipment:

Domestic Ranges	5 types
Automatic Storage Water Heaters	2 types
Electrolux Refrigerator	1 unit
Radiant Fire	1 unit
House Heating Furnaces	3 types

These were all connected to a manifold system that could carry either our regular gas (oven gas and producer gas mixture) or whatever test mixture we chose to examine. To change from our test mixture to our regular gas or vice versa was only a matter of a few minutes. Each appliance was equipped with a suitable gas meter, and the entire manifold was under controlled pressure—the holder to a large extent automatically taking care of this. Each burner on each appliance was carefully adjusted to the gas input specified by the manufacturer, and if the appliance had only one burner, the primary air adjustment on that burner was adjusted so that the air-gas mixture had a B.t.u. value of 175. If the appliance had more than one or several burners, one burner was adjusted to have a burner head mixture of 175 B.t.u./cu.ft., and of the other burners some were set to have burner head mixtures above 175 and about the same number of burners were set to have a burner head mixture of less than 175 B.t.u./cu.ft., the variation being from 85 B.t.u./cu.ft. to 250 B.t.u./cu.ft.

These settings were all made while the burners were handling our regular gas, namely, a coke oven gas and producer gas mixture having about 540 B.t.u. value. After input adjustments and primary air adjustments were once established on every burner, both adjustments were definitely locked in position and not changed at any time until this vast amount of test work was entirely completed. (The job took about three months of continuous work.)

Our purpose of test was to find out first how these burners behaved on gas such as we had been in the habit of making to meet our various sendout loads, namely, coke oven gas and producer gas mixtures

supplemented by varying quantities of 540 B.t.u. water gas necessary to meet given sendouts. After having established this, we put through these same burners a mixture of coke oven gas and blue gas (540 B.t.u./cu.ft.) supplemented by varying amounts of 540 B.t.u. water gas so that the sum of the coke oven gas plus the blue gas and the water gas in each case equalled the same sendout quantity used in the first setup.

Table II will show this more clearly than I can put it in words. In short, this setup showed us what variations in burner performance we might expect when meeting a variety of sendout loads made up according to the two different systems of mixtures. In addition, the table also shows how these same burners with their respective adjustments behaved when fed by a mixture of 55% regular gas (coke oven and producer gas) of 539 B.t.u. and 45% 615 B.t.u. water gas and also when using the same proportional mix as above except the coke oven gas plus producer gas portion had a B.t.u. of 496.

Burner Performance

A brief explanation of the terms Burner No. B, A. G. A. Index C, and Willien's Factor are necessary in order to understand the data in Table II.

The Burner Number B represents the reading obtained on the Rochester test burner described in the 1940 A. G. A. Proceedings, pages 685 through 716. It further represents a reading on an arbitrary scale with all values above zero being positive and all values below being negative. This test burner consists of an atmospheric burner equipped with primary air or gas-controlled devices which operate over an arbitrary scale and the cone-forming properties of the flames are used to differentiate one gas from another. The results are all expressed in independent or empirical units, and the test burners may be employed only after the scales have been calibrated in terms of the gas similar in character and composition to those which are to be checked. Satisfactory performance on appliance burners will result when Burner Numbers range between 52 and 90+. Readings lower than 52 would indicate flashback tendencies, while readings above 90+ would indicate long flames and yellow tips.

The A. G. A. Index C represents the interchangeability of different gas mixtures. After correlating many actual appliance tests, the A. G. A. attempted to express the relationship between burner, appliance, and gas composition by a rather complicated mathematical expression, which was described in detail in the Mixed Gas Research A. G. A. Report No. 689. For continued satisfactory performance of appliances, when the gas on which they have been adjusted to perform satisfactorily is to be replaced by another gas, the value of the A. G. A. Index C should fall between .85 and 1.15.

The Willien's Factor represents a short cut method of calculating the interchangeability of gases from the B.t.u. and specific gravity of the gases. It is based upon the B.t.u. per cu.ft. of primary air and gas mixture in the burner head and satisfactory performance may be expected when these values range between 165 and 185. It is described in the 1938 A. G. A. Proceedings, pages 843 through 856.

Analysis of the various gases and mixture of gases employed in this study are presented in Table III.

With these things in mind examination of the data clearly indicates we should expect no increase in customer complaints by reason of substituting blue gas for producer gas. As a matter of fact we had good reason to expect a decrease in customer complaints.

Incidentally let me say that Table II is a condensation of a complete report on this entire work comprising some 80 odd closely typewritten pages, but inasmuch as I am presenting in this paper all of this work as a completed project showing in general its various phases and their application, I thought it wise to leave out this enormous amount of detailed data. (It may later be published. Anyway it is all available to anyone wishing to study it.)

Blue Gas Addition Desirable

To summarize what has been considered rather thoroughly thus far: We were definitely sure we could make the blue gas necessary for this method of operation, and as far as the plant operations were concerned, everything pointed to blue gas addition as being more desirable and the extensive test work on appliances strongly indicated we had improvements to gain as far as utilization was concerned, so we had enough to proceed to meet directly our winter loads of 1940-41 by adding blue gas to our oven gas and making as little 540 B.t.u. water gas as possible and consequently using as little gas oil as possible. The advantage in presenting this paper at this time is that we have had an opportunity to operate actively this system over a winter peak and from an operating point of view, all our preliminary work has been proved to be correct.

The tabulation on the next page will show briefly the pertinent operating data covering gas load production for the winter season of 1939-1940 as compared to that of 1940-41, the period in each case being December-April (both inclusive):

TABLE II

CHANGES IN THE BURNER PERFORMANCE RESULTING FROM THE SUBSTITUTION OF CERTAIN GAS MIXTURES CONTAINING BLUE GAS FOR ROCHESTER, N. Y. CITY GAS

Composition of Mixtures	*Production Capacities*		*Analysis of Mixtures*					*Average Effects upon Burner Operation*				
										Summary of Averages		
										Reference Gas = 100		
	M Cu.Ft./ Day	*Percent Increase*	*B.t.u./ Cu.Ft.*	*Sp.Gr. 60° F.*	*Burner No. B*	*A.G.A. Index C*	*Willien's Factor*	*Burner Head Mixture B.t.u./ Ft.³*	*Inner Blue Cone Height Cm.*	*Burner Rating*	*Burner Head Mixture*	*Inner Blue Cone Height*
COG + PG + CWG			Coke Oven Gas, Producer Gas and Carburetted Water Gas Mixtures									
1. COG + PG (Reference Gas)	15,500	0	539	.489	84	1.000	175	183	1.38	100	100	100
2. COG + PG + 10% 540 CWG	17,230	11	539	.503	76	.948	174	180	1.37	99	98	98
3. COG + PG + 24% 540 CWG	20,280	31	539	.527	68	.930	171	178	1.25	97	97	90
4. COG + PG + 37% 540 CWG	24,610	59	540	.539	64	.887	170	177	1.22	96	96	87
5. COG + PG + 50% 540 CWG	31,340	102	539	.551	56	.861	168	174	1.20	94	95	86
6. COG + PG + 64% 540 CWG	43,020	178	539	.563	51	.840	167	171	1.13	94	93	83
COG + BG + CWG			Coke Oven Gas, Blue Gas, and Carburetted Water Gas Mixtures									
1. COG + PG (Reference Gas)	15,500	0	539	.482	86	1.000	175	182	1.38	100	100	100
2. COG + BG	17,230	11	538	.444	80	1.050	180	190	1.30	104	104	94
3. COG + BG + 15% 540 CWG	20,280	31	540	.475	75	.959	176	185	1.32	102	103	96
4. COG + BG + 30% 540 CWG	24,610	59	540	.502	65	.927	173	182	1.18	99	100	86
5. COG + BG + 45% 540 CWG	31,340	102	539	.532	58	.863	169	177	1.08	96	97	78
6. COG + BG + 60% 540 CWG	43,020	178	537	.560	52	.813	166	171	0.92	92	94	67
High B.t.u. CWG Mixtures			Coke Oven Gas, Producer Gas, and High B.t.u. Carburetted Water Gas Mixtures									
1. COG + PG (Reference Gas)	15,500	0	539	.489	84	1.000	175	183	1.38	100	100	100
2. 539(COG + PG) + 45% 615 CWG	28,180	82	570	.538	72	1.024	179	180	1.42	95	98	103
3. 496(COG + PG) + 45% 615 CWG	31,500	103	543	.578	57	.873	167	174	1.08	91	95	78

	Total S.O.	W. Gas Made	Coke Used	Oil Used	Oil/M	Fuel/M.
1939–40	2,482,542 M	171,580 M	2,738 T	506,046 gal.	2.95 gal.	32.0 lbs.
1940–41	2,478,617 M	539,241 M	10,038 T	176,895 gal.	.33 gal.	39.6 lbs.

A casual observation will indicate the following:

1. Total load carried is about the same for both periods.
2. The amount of gas oil used was considerably less.
3. The amount coke used was more by about 7300 tons.

From an operating point of view we accomplished all we had set out to do. From a gas distribution point of view as far as troubles on that system were concerned, including customer service complaints, it was the best the department has ever had. Actually, the service complaints were about 20% less. What portion of this decrease was due to the training given our service men in properly adjusting appliance burners and what part is due to the type of gas we distributed is of course rather hard to tell—perhaps impossible to tell. The net result with which this paper is mainly concerned was gratifying. The experience was so satisfactory that we intend to do the same again this coming winter season.

Advantages from an Operating Point of View

1. Decrease in amount of gas oil used. This was sizable, and, of course, we were rather fortunate in doing this work a year ago for obviously the conservation of gas oil or, more broadly speaking, enriching oil is of prime importance now and bids well to gain in importance.
2. We used considerably more coke, which we make ourselves, thereby enabling us to more nearly run our ovens to capacity for a longer time which in turn means we made more oven gas than we could possibly make by the other setup.
3. When making blue gas to meet an equivalent carburetted water gas load, more machine capacity has to be on the line, and this comes in very handy when one is faced with heavy winter loads for if anything happens to the base load coal gas equipment, one can immediately increase all the machine capacity by 25% to 30% by merely adding oil and going on straight carburetted water gas operation. This can be done in a very few minutes. Also, it is well to keep as much of our spare water gas equipment in operation as possible.

As outlined before, there was one other interesting by-product resulting from the work we did on burner control. Soon after we started the work it became obvious that a service man should have some way by which he could tell definitely when he has adjusted any appliance burner correctly. This is quite a large order because of the vast number of burners of various types on the market operating on a large variety of gas mixtures. In the development of this thought several possibilities presented themselves, and most of them, while good from a technical point of view, were "thrown out the window" because they were too complicated or too cumbersome for a battery of practical men to handle.

I don't want to present here in detail just what was done but from close observation of the thousands of tests and observations we made when we studied the behavior of the combustion characteristics of various gases when used in the variety of appliances we had set up, it became evident that, on final analysis, all a good service man needs now is good eye sight and a clear conscience. The whole thing centers around the behavior of the inner cone of a flame with respect to the outer cone. First, of course, a man must be trained as to what to observe and how to get what he wants. This is not hard to do. The service man appreciates this simplicity mostly because he is not as a rule technically minded, and secondly, he is not encumbered by carrying a lot of technical apparatus around with him while doing his day's work.

First then the man has to be taught by sight and further he ought to have made available to him a standard to which he can refer as frequently as he chooses in much the same way that a trained chemist refers back to a standardized solution or as an engineer refers back occasionally to many standardized basic fundamentals. So we set up in our distribution department a group of carefully adjusted burners that serve the purpose of a standard. To these he can refer at will. In addition the entire group is periodically required to go over this entire procedure under the leadership of a trained technician and the department superintendent.

We think this is a step in the right direc-

TABLE III
SUMMARY OF GAS ANALYSES

COG + PG + CWG	Coke Oven Gas, Producer Gas and Carburetted Water Gas Mixtures								
					COG + PG Mixtures with				
Type of Gas	COG + PG Reference Mixed Gas	COG Coke Oven Gas	PG Producer Gas	CWG Carb. Blue Gas	10.0% CWG	23.6% CWG	37.0% CWG	50.5% CWG	64% CWG
Analysis:									
CO_2	3.3	2.0	6.1	4.3	3.1	4.1	4.0	3.9	3.7
Ill.	3.6	4.5	0.0	9.1	4.3	5.1	5.8	6.1	6.9
O_2	0.2	0.1	0.0	0.2	0.0	0.1	0.1	0.1	0.2
CO	10.5	6.3	27.5	31.3	13.1	15.3	18.1	20.5	23.1
H_2	44.5	50.7	13.6	36.7	45.8	41.5	42.0	41.3	40.0
CH_4	27.4	35.2	0.6	13.4	24.8	24.4	21.7	20.7	18.9
N_2	10.5	1.2	52.2	5.0	8.9	9.8	8.3	7.4	7.2
B.t.u./cu.ft.	539	650*	139*	540	539	539	540	539	539
Sp. Gr. at 60° F.	.489	.396*	.880*	.633	.503	.527	.539	.551	.563
Burner No. (B)	84	155	...	31	76	68	64	56	51
A. G. A. Index C*	1.000	...	...	.734	.948	.930	.887	.861	.840
Willien's Factor F	175	...	...	160	174	171	170	168	167

COG + BG + CWG	Coke Oven Gas, Blue Gas, and Carburetted Water Gas Mixtures								
						COG + BG Mixtures with			
	COG + PG Reference Mixed Gas	COG Coke Oven Gas	BG Blue Gas	CWG Carb. Blue Gas	COG + BG Special Mixed Gas	15% CWG	30% CWG	45% CWG	60% CWG
Analysis:									
CO_2	3.2	2.0	8.6	5.5	3.5	3.7	4.1	4.5	4.6
Ill.	3.5	4.5	1.1	9.6	3.1	4.1	5.0	6.2	6.7
O_2	0.3	0.1	0.5	0.1	0.1	0.1	0.1	0.1	0.2
CO	10.2	6.3	33.8	30.1	12.5	15.3	17.9	20.6	22.8
H_2	44.2	50.7	45.4	36.1	49.5	48.3	45.8	44.1	41.7
CH_4	27.9	35.2	3.8	12.7	26.2	23.7	22.2	19.5	18.4
N_2	10.7	1.2	6.8	5.9	5.1	4.8	4.9	5.0	5.6
B.t.u./cu.ft.	539	650*	319*	540	538	540	540	539	537
Sp. Gr. at 60° F.	.482	.396*	.598*	.639	.444	.475	.502	.532	.560
Burner No. B	86	155	....	32	80	75	65	58	52
A. G. A. Index C*	1.000	....	....	.710	1.050	.959	.927	.863	.813
Willien's Factor F*	175	....	....	159	180	176	173	169	166

High B.t.u. CWG Mixtures	Coke Oven Gas, Producer Gas, and High B.t.u. Carburetted Water Gas Mixtures						
	1	2	3	4	5	6	7
	COG + PG Reference Mixed Gas	COG Coke Oven Gas	PG Producer Gas	CWG Carb. Blue Gas	Low B.t.u. COG + PG Special	55% of No. 1 45% of No. 4	55% of No. 5 45% of No. 4
Analysis:							
CO_2	3.3	2.0	6.1	3.7	3.9	3.1	4.2
Ill.	3.6	4.5	0.0	11.8	3.4	7.0	7.3
O_2	0.2	0.1	0.0	0.1	0.1	0.1	0.1
CO	10.5	6.3	27.5	29.2	13.5	18.8	20.2
H_2	44.5	50.7	13.6	32.5	38.1	40.7	37.1
CH_4	27.4	35.2	0.6	18.2	25.5	23.2	21.0
N_2	10.5	1.2	52.2	4.5	15.5	7.1	10.1
B.t.u./cu.ft.	539	650*	139*	615	496	570	543
Sp. Gr. at 60° F.	.489	.396*	.880*	.640	.544	.538	.578
Burner No. B	84	155	....	66	58	72	57
A. G. A. Index C*	1.000	....	....	1.022	.792	1.024	.873
Willien's Factor F*	175	....	....	182	155	179	167

Note: *Calc. from Analyses.

tion for after all one of the biggest jobs we have is to render satisfactory service to our customers. This is a very important phase of our work. We as a utility benefited by this training in another way. There are, as you might expect, other large concerns in our city who sell a great variety of gas-burning equipment and who service a large share of it. These people, upon learning that we had instituted a training school for our own men, asked if their men might also be included. We, of course, welcomed this and trained outside service men along with our own. This, too, was good business as judged by the many appreciative letters from executives of these concerns, and it has brought about a better understanding all around. This all leads generally to better adjusted appliances, and because of that the utility, and distributor, and the customer are all better off.

Studies along the line of burner adjustments led to another interesting development. As you all know, some househeating units are equipped with burners of rather elementary design in that they "pop back," and there is a definite noise of extinction. This noise of extinction is, on final analysis, nothing more than a minor explosion within the burner mechanism. It is objectionable because people, particularly in the better class of homes, don't wish to be annoyed by having to listen to an intermittent series of bangs all day and all night. Study indicates that the much better designed ribbon-type burner will entirely eliminate this nuisance. Incidentally, it might not be amiss at this point to mention that the field for design of good gas burners particularly in househeating units is wide open. It presents interesting possibilities, and the rewards should be most gratifying.

Another comment of interest is that all of this work and the changes in operation and utilization have been brought about without the addition of capital, i.e., only existing equipment was involved.

Taken as a whole the paper outlines what, for us, has been an interesting piece of work so knit together that we are able not only to use it as the basis for various operating techniques but can use certain phases of it as stepping stones to other developments. Further than that, we sincerely hope that we have expressed ideas that will be taken up by others in the gas industry who can use certain phases of it as stepping stones toward further progress.

Fire Prevention Week

THE week of October 4 has been set aside by the President as Fire Prevention Week and all gas companies are urged to participate in its observance. It has been pointed out that at no time since 1920 when the first week's educational and conservation program was inaugurated has fire prevention been so imperatively necessary as it is in this year of war. "Today Every Fire Helps Hitler," is the slogan.

ANNUAL MEETING PROGRAM

(Continued from page 336)

smith, Brooklyn; "New O.D.T. General Order 21 and Its Possible Effect on Public Utility Fleets," Linn Edsall, Philadelphia. In addition there will be papers presented as follows: "Nitric Oxide Control," Louis Shnidman, Rochester; "Research in Organic Sulfur," Dr. E. W. Guernsey, Baltimore; and "Research on Microbiological Anaerobic Corrosion," Dr. R. F. Hadley, Philadelphia.

Important committee reports reflecting many wartime contributions which will be distributed at the meeting include: Gas Production, R. H. Arndt, chairman; Gas Conditioning, H. D. Lehman, chairman; Chemical, R. J. Sheridan, chairman, and Operation of Public Utility Motor Vehicles, Jean Y. Ray, chairman. An open forum will follow the regular meeting at which these reports will be discussed.

TIN CONSERVATION

(Continued from page 342)

Summarized Conclusions

(a) Solder of two low tin content composition has been found which appear to give acceptable results on test and in the shops.

(b) Appreciable economies in tin will result from the use of the recommended solder formulae.

(c) To use the recommended solders the shop mechanics require a certain length of time to adjust themselves to the low tin content solders. The results at first are disappointing.

(d) It must not be assumed that the final answer to the problems has been found. It is hoped that other investigators will check the results herein reported and will try other solders of widely varying compositions and possibly other shop tools to the end that the performance obtained may be further improved and possibly greater economies in tin consumption realized.

NOTE: The authors wish to acknowledge the assistance given by C. C. Bahr, Jr., L. F. Falkenstein, L. A. Pagano and J. Zak in the preparation of this article.

APPENDIX

Items Relating to Repairs of Gas Meters Using 30% Tin Content Solder

1. *Fluxes*

(a) For parts that are tinned the following composition flux used liberally has been found to give good results:

Material	*Amount*
Dry Rosin	5 Lbs.
Red Oil (Oleic Acid)	5 Gallons
Diaphragm Oil (Neutral Oil) Corning Oil Company	½ Pint
Socony No. 2300 Wax	¼ Lb.

Melt rosin and mix with hot red oil. Dissolve wax in hot neutral oil and mix with red oil and rosin.

(b) The following acid flux is used for corners and untinned parts:

Material	*Amount*
Zinc Chloride	16 Lbs.
Water	1 Gallon

Dissolve zinc chloride in water.

2. *Solder*

The solder compositions on which this procedure is based are:

Material	*Per Cent*
(a) Tin	30.0
Arsenic	0.1
Antimony	1.8
Lead	68.1
(b) Tin	30.0
Antimony	2.0
Lead	68.0

3. *Form of Solder*

¼" x ¼" bar solder either extruded or cast.

4. *Surfaces*

Prior to tinning, meters and parts are thoroughly washed in the usual manner.

All surfaces to be soldered are then thoroughly tinned with the solder existing on the meter being repaired. For the tinning operation, the oil flux (1a) specified above is used.

5. *Irons*

Two (2) (2½ lbs. each) irons are used alternately. The irons may be tinned with either 50% or 30% tin content solder. If the latter is used the irons will require more frequent tinning.

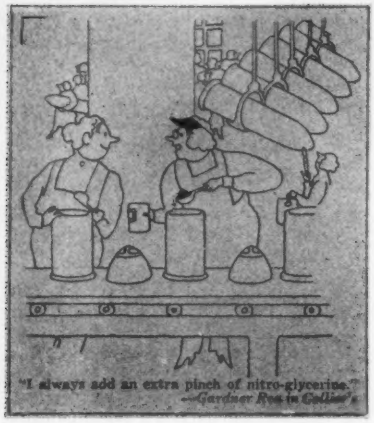
6. *Seams*

First sweat the seams and on the second application apply a bead as usual. In soldering the seams care should be taken to prevent the heat from spreading far into adjacent metal surfaces in order to prevent cracking as the solder solidifies. Practice in this detail is required in order to enable the meter repairer to perform consistent work.

It's Done with a Mirror

FOR suggesting the use of an adjustable magnifying mirror at the preliminary proving table in the gas meter shop, John Addison of the Public Service Electric & Gas Co., Newark, N. J., received a $10.00 award from his company.

The date and nature of the last previous repair of gas meters is shown on the repair badge soldered on the back of the meter. The adjustable magnifying mirror provides a method of getting this information for insertion in the proving information book without turning meter around.



Lone Star Expands to Meet Peak Loads

A NATURAL gas supply sufficient to meet unprecedented peak demands on Lone Star Gas Company, Dallas, Texas, industrial and domestic lines for the coming winter will be assured with the completion of construction work now under way. Seven new pipe line projects completed or nearing completion throughout the system and a new compressor station being constructed in the Waco area, are part of the huge-scale program which will call for even further line construction before the winter season reaches its peak.

The new Compressor plant is located east of Waco on the North bank of the Brazos river where Lone Star's 16-inch line L crosses. It will facilitate service in that area and will operate nine Cooper compressor engines of 170 horsepower and will handle a peak load of around 40,000,000 cubic feet of gas. Plant construction is under the supervision of A. B. Hemphill, assistant engineer. M. W. Crowder is district compressor engineer.

Cleveland Laboratories' Staff Outing

THE fifteenth annual picnic of the A. G. A. Testing Laboratories' staff was held Saturday afternoon, August 29, at the Pine Ridge Country Club located near Cleveland. Seventy-three persons attended, including the wives and families of the staff members. Advantage was taken of ideal weather to spend a most enjoyable day. Such prizes as were given were all in War Savings Stamps. A large proportion of the normal expenditures were conserved to purchase Christmas gifts for Laboratories' employees now in the Armed Services.

An excellent buffet dinner was served at 7:00 P.M. All after dinner festivities were capably handled by the toastmaster, K. H. Flint, Assistant Chief Testing Engineer. R. M. Conner, Laboratories' Director, provided the after dinner speech, complimenting the staff on its cooperation throughout the year. He also discussed briefly the growing operations of the War Products Department and the encouraging progress being made on its present assignments.

Named Home Volunteer Board Advisor

IN furthering its wartime services to the gas industry, Servel, Inc., has appointed Jessie McQueen, home service counsellor of the American Gas Association, as a member of the Home Volunteer Advisory Board. The second member to be appointed to the board, Miss McQueen, joins J. Ernestine Becker, nationally known nutrition authority who heads the board.

Miss McQueen will represent the gas industry and home service groups, counseling in the adaptation of plans and materials on nutrition and home conservation. The prime purpose of the board is to correlate and organize along practical lines the use of food and nutrition material developed by all government, state and volunteer agencies.

RADIO INTERVIEW

(Continued from page 339)

which industry needs to keep winning the Battle of Production. Incidentally insulation, storm sash and doors, and weather-stripping will cut the heating cost in any house by as much as 40 per cent—and make it a more comfortable place in which to live.

Mr. Thompson: The picture you have given us of the Natural Gas business, Mr. Borger, and its place in our all-out war program, has been most interesting, and on behalf of the Pittsburgh Chamber of Commerce, I want to thank you for appearing here tonight.

Mr. Borger: It has been a pleasure, Mr. Thompson. The Natural Gas industry is proud of the fact that it is privileged to make an important contribution to our war production program. And it will continue unreservedly to devote itself and all of its resources to the end that Victory shall be ours at the earliest possible moment.

Announcer: We have just heard another of the weekly programs broadcast every Tuesday night over this station as a public service by the Greater Pittsburgh Committee and dedicated to the subject "Pittsburgh Prepares." Our speaker tonight has been Mr. Edward M. Borger, president of the Peoples Natural Gas Company, representing the Natural Gas Companies Serving the Greater Pittsburgh Area. He was interviewed by Mr. James Thompson. We thank Mr. Borger for his discussion of the role of natural gas in war. This program is presented each Tuesday night as a special service feature of radio station WJAS.

War production customers need the best engineering help possible in selecting proper gas equipment now. Industrial gas men and manufacturers have done a good job up to now. Keep it up!

Personnel Service

SERVICES OFFERED

Graduate Mechanical Engineer—Seven years' experience production and distribution manufactured gas. Eight years' industrial gas sales. All above with large system covering all phases of industry. One year industrial sales engineer liquefied petroleum gas. Draft deferred, free to travel, locate anywhere. Prefer utility or allied line where experience would count. **1449.**

POSITIONS OPEN

Well known gas appliance manufacturer requires the services of a thoroughly **capable engineer** with **executive** experience to take charge of design and development of a major gas appliance to be ready for the market immediately after the war. Give full details regarding experience and salaries earned in previous positions in first letter. **0370.**

MEN WANTED

Agencies of the U. S. Government and gas companies are continuously asking for lists of available personnel qualified by education and experience to serve in the many branches of the industry. Some of the company vacancies offer an excellent opportunity for advancement. Is your filed record up-to-date? Ask for one of our Confidential Classification Records if you are available and have not already filed one.

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PRINTED IN U. S. A.